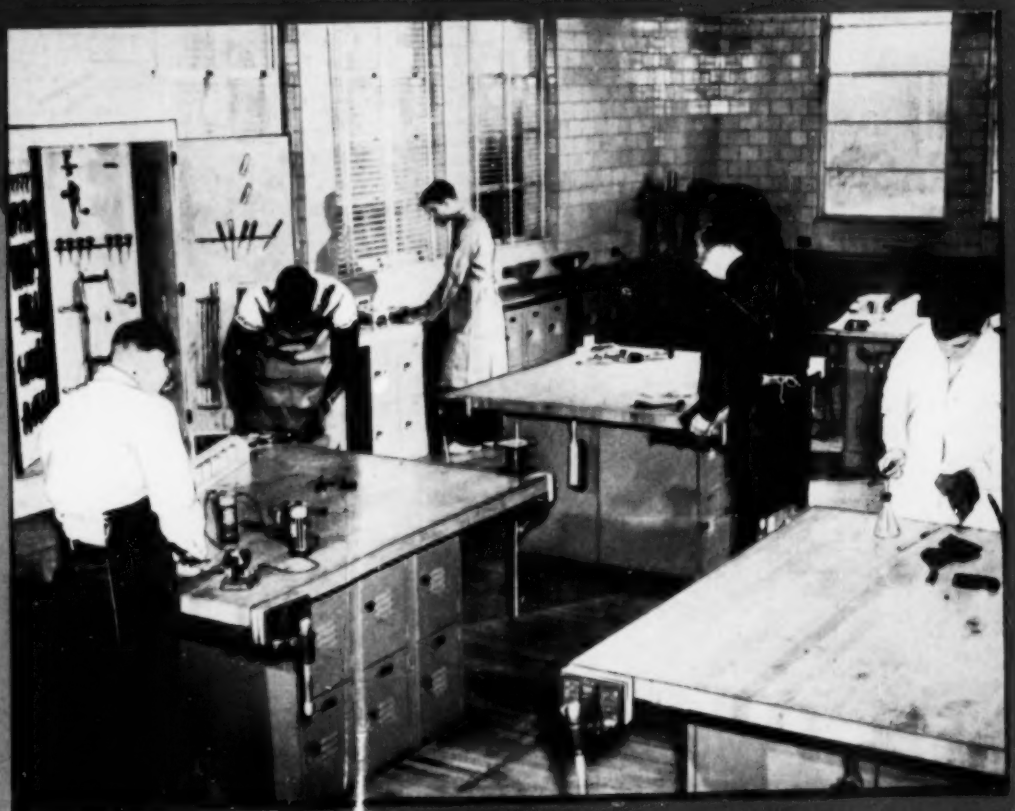
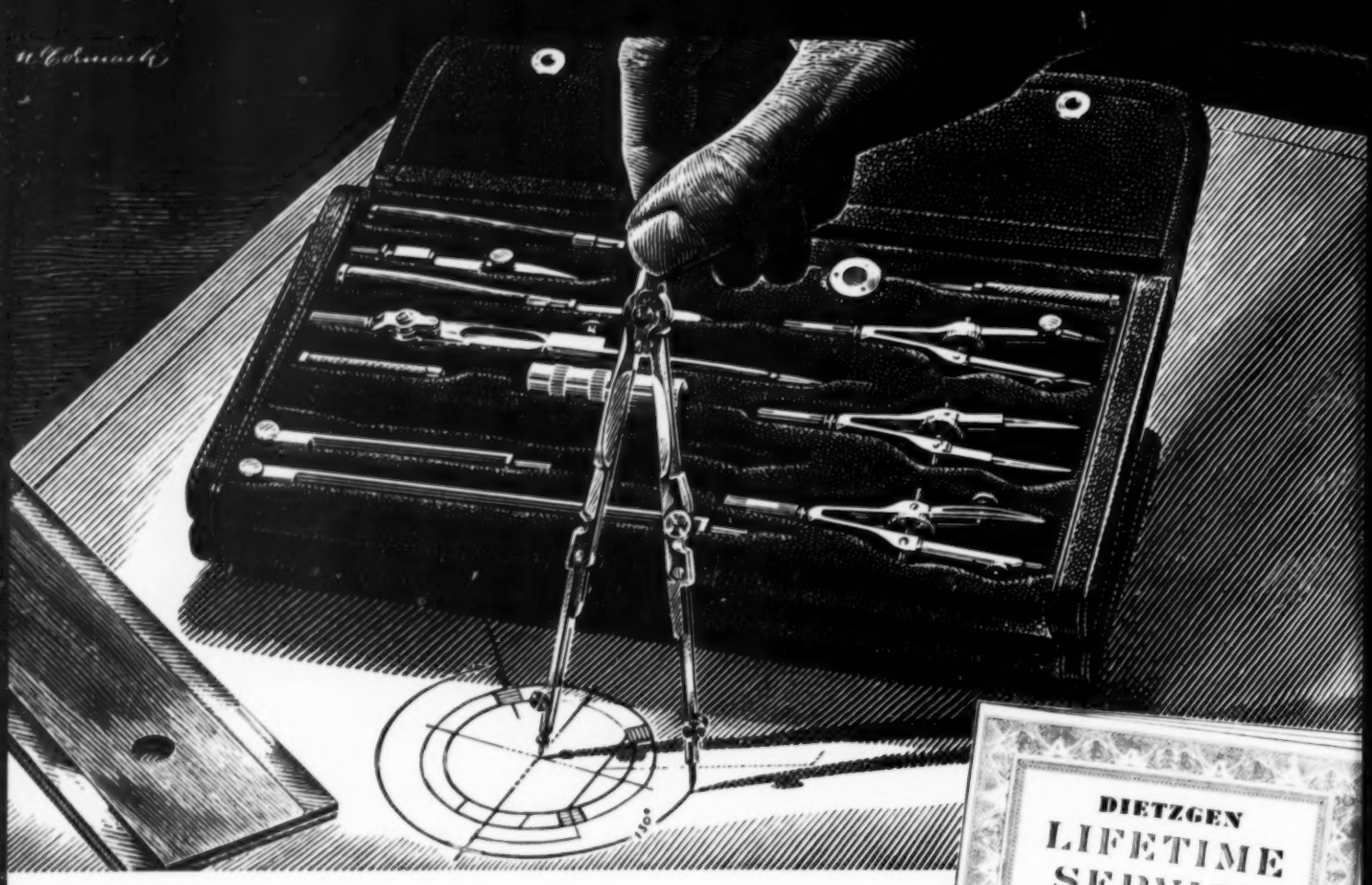
SEPTEMBER, 1954 Vol. 43, No. 7

Industrial Arts and Vocational Education



The Shop Teachers' Professional Magazine

In this Issue: "A Student Eye Protection Program"



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Every year thousands of youngsters reach the point in their schooling where each is suddenly faced with the requirement of purchasing a set of drawing instruments. When the boy is the son of a technically trained father or when he asks the advice of a conscientious drafting instructor, the problem of selecting the proper drawing instruments is quickly answered. These men know drawing instruments are normally purchased but once in a lifetime, that the make of instruments selected can be either a matter of many years of rewarding satisfaction or of continual regret.

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WAGES UP 150%
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PRICES UP 49%
Prices are closely tied to costs. Costs are still rising. Buy now before increased costs necessitate higher prices.

"HOW TO RUN A LATHE"
The original and complete student handbook on the operation and care of metalworking lathes. New revised edition 51 describes latest shop methods and practices. Clearly written in simple, non-technical language. Every student should have a copy. 128 pages—365 illustrations. 50c per copy postpaid. Also published in Spanish, Portuguese and French.

"HOW TO RUN A DRILL PRESS"
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"HOW TO RUN A SHAPER"
The operation of the metalworking bench shaper is clearly explained in this 32-page handbook. Many practical job set-ups shown. 25c per copy.

"THE METAL WORKING LATHE"
Film No. I Introduces the student to the standard back-geared, screw-cutting lathe by familiarizing him with principal lathe parts, their names, purpose and operation. Showing time, 20 min. 16 mm sound in full color. *Free loan.*

"PLAIN TURNING"
Film No. II Teaches all basic operations in between centers machining. Shows use of calipers and micrometers, drilling center holes, selecting cutter bits, facing, rough and finish turning. Time, 20 min. 16 mm sound, full color. *Free loan.*

"GRINDING and USE of BASIC LATHE TOOL CUTTER BITS"
Film No. III Shows grinding of cutter bits for rough and finish turning, cutting off, thread cutting. Also, tool adjustment and action. Time, 20 minutes. 16 mm sound, full color. *Free loan.*

All South Bend motion pictures available with sound track in English, Spanish, or French.

FOUR "WALL CHARTS"
"Principal Parts of a Lathe," "How to Become a Machinist," "Decimal Equivalents," "Tap Drill Sizes" — 15c each.

SHOP PLAN MODEL KIT
Take the guesswork out of planning the school shop. Write for Bulletin 5301 which shows how South Bend's ¾" scale model kit allows 3-D's to save time and cost.

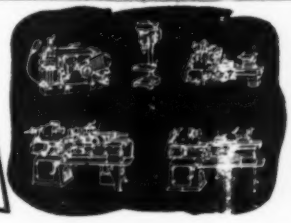
"MACHINE SHOP COURSE BOOK"
Contains 12 practical projects complete with step-by-step instructions and drawings. Projects for both beginners and advanced students. Widely used. 32 pages. 50c per copy.

CATALOG 5406
Every shop instructor and supervisor should have this new 56-page catalog. It illustrates all the types, models and sizes of South Bend machine tools preferred by educators.

HOW TO ORDER
Sample copies of all printed teaching helps will be sent free upon request to school shop instructors and supervisors. Also request loan information on training films.

SOUTH BEND LATHE WORKS
SOUTH BEND 22, INDIANA

Building Better Tools Since 1906



SOUTH BEND MACHINE TOOLS

Toolroom Lathes: 9", 10", 13", 14½" and 16" swings.

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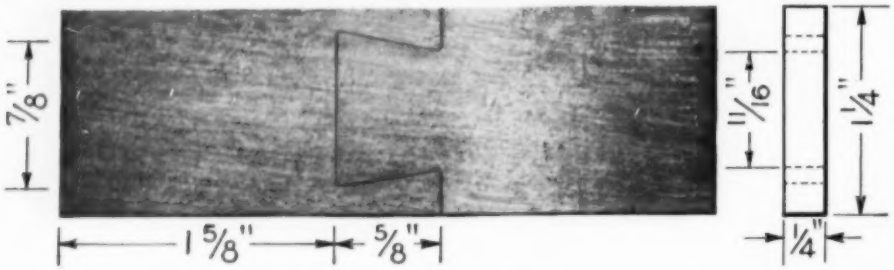
Attachments and Tools: For lathes, drill presses, shapers.

HOW-TO project for the School Shop

—by NICHOLSON FILE COMPANY

NO. 1 OF A SERIES

MAKING A DOVETAIL OR INTERLOCKING JOINT



Technical students learn fast when they learn by practice. Nicholson is happy to help stimulate school-shop interest through a series of fundamental mechanical problems, the first of which is treated here. The photograph shows the finished job with specified dimensions. The requisites and schedules of operations follow.

Material: Two pieces cold rolled steel, each 1 1/4" x 1/4" x 2 1/4". **Tools:** Copper (or other soft metal) vise jaw "protectors"; 6" rule; scratch-awl; surface gauge; 3" dividers; center punch; 3/16" drill; hacksaw; square; 12" smooth-cut Nicholson Mill File; 8" second-cut Nicholson Half Round File—or 6" 0-cut Nicholson X.F. Swiss Pattern Barrette File for greater precision. (These files shown at right.)

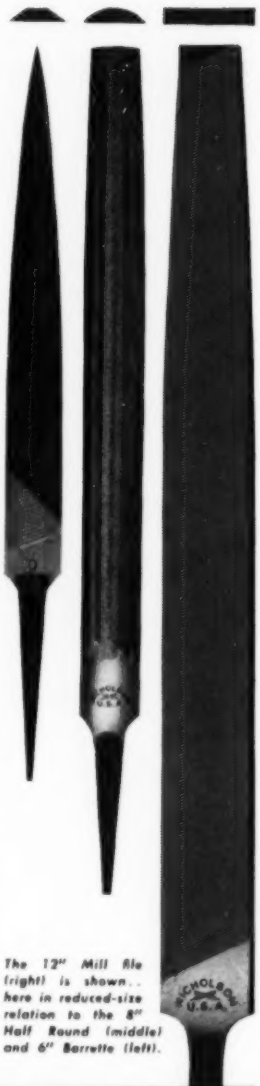
SCHEDULE FOR MORTISE

1. Square mortise end of mortise piece with flat side of the 8" Half Round or Barrette file. Check with square. **2.** Paint both surfaces with layout dope. **3.** Set surface gauge to 5/8" and scribe line on squared end of both pieces. **4.** Scribe center line 5/8" through length of each piece. **5.** Set dividers to 7/16" and, with one leg of dividers at intersection, scribe arcs at each side of center line for mortise. Do the

same at tenon end of second piece. **6.** Set dividers to 11/32" and scribe arcs at edge of mortise and on each side of center line of tenon. **7.** With rule connect arcs. **8.** Set surface gauge to 7/16" and scribe line through mortise. Locate three equal marks with center punch for drilling. **9.** Go to drill press, hold work in vise and drill three 3/16" holes. **10.** Place mortise in vise and with hacksaw and cold chisel remove center section. **11.** Rough-file, using the 8" Half Round or 6" Barrette file, leaving lines for finish filing. **12.** Before finishing mortise, check over work thoroughly for any unevenness or mistakes in filing. **13.** Finish-file mortise to dimensions and check carefully for squareness, using the 8" Half Round or 6" Barrette file. **14.** Have piece checked by an instructor for squareness and uniformity.

SCHEDULE FOR TENON

15. Rough-file both sides, leaving lines showing. Use the 8" Half Round or 6" Barrette file. **16.** Holding file so that its safe edge is on shoulder side of work, clean out shoulders, using the 6" Barrette file. **17.** File one side of tenon to fit one side of mortise, using the 8" Half Round or 6" Barrette file. **18.** File other side of tenon to fit mating side of mortise, allowing about .005" for forcing work together. **19.** Oil joint before forcing work together in vise, using the soft-metal jaw "protectors" to prevent marring surface of work. **20.** File all over, making all surfaces flat and square. Draw-file or straight-file with diagonal strokes, using the 12" smooth-cut Mill file. Chalking the file will produce a finer finish and reduce the possibility of scratching the surface of the work.



The 12" Mill file (right) is shown here in reduced-size relation to the 8" Half Round (middle) and 6" Barrette (left).

FREE REPRINTS OF THIS PAGE

for school-shop use will be sent to school heads or instructors on individual request. Ask for "How-to Project No. 1" and give minimum number of copies you need. The files recommended in the foregoing text and illustrated above can be obtained through industrial supply houses or good hardware stores.

NICHOLSON FILE COMPANY
77 Acorn St., Providence 1, Rhode Island World's foremost manufacturer of A FILE FOR EVERY PURPOSE
(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

SEPTEMBER
1954

VOL. 43 No. 7

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

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This Month's Cover

The picture chosen for the cover of the 1954 School Opening number of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION shows a portion of the transportation, power, and communication area at Ball State Teachers College, Muncie, Ind., under the supervision of Lloyd Nelson.

Photography by Bernard R. Josif, assistant professor of industrial arts.

★ ★ ★ ★

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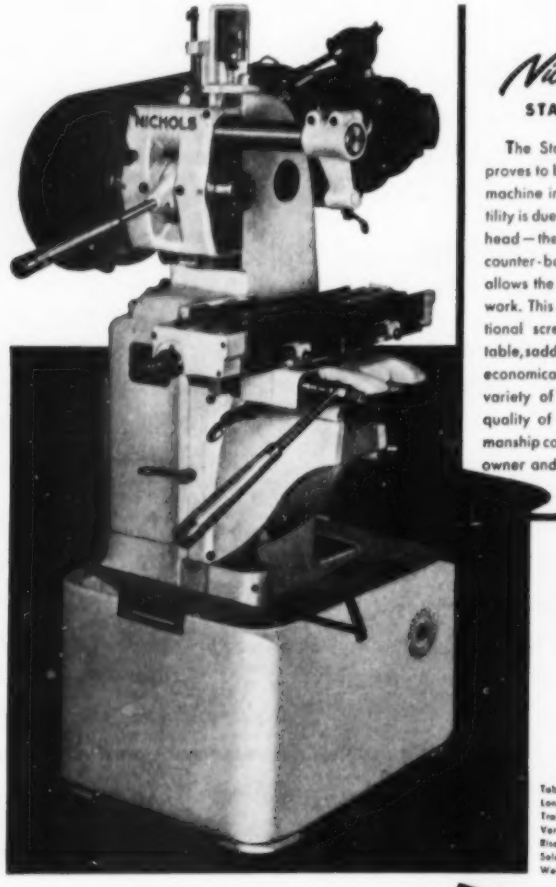
Association News

COLORADO INDUSTRIAL ARTS CONVENTION

Walter Swallow, teacher of industrial arts at Pueblo Central high school, Pueblo, Colo., was elected president of the Colorado Industrial Arts Association at the Association's second annual convention held recently at Colorado State College of Education, Greeley, Colo. He succeeds Alan M. Lytle of West Denver high school as president.

Dr. Clarence T. Baab of the CSCE faculty and Harold Underhill of West Denver high school, hold over as vice-president and secretary-treasurer, respectively.

Dr. Louis V. Newkirk, chairman of the division of industrial arts of the Chicago public schools, addressed the afternoon session on the industrial-arts program in schools. Dr. William R. Ross, president of the college, spoke at a luncheon at the Tea House on the subject "On the Track of Early Man."



Nichols Miller
STANDARD MODEL

The Standard Nichols Miller often proves to be the handiest (and busiest) machine in the shop. Its unusual versatility is due to the "rise and fall" spindle head — the spindle being mounted in a counter-balanced sliding head which allows the cutter to be brought to the work. This unique feature, plus conventional screw or lever movements of table, saddle and knee, guarantees fast, economical production on the widest variety of parts. And the unexcelled quality of Nichols' design and workmanship commands the respect of every owner and operator.

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Vertical Travel — Knee	13½"
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Selective Speed Ranges up to 5000 R. P. M.	
Weight	1280 lbs.

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The association members voted for the appointment of a five-man committee to make a study of school shop safety, accident report, accident analysis and the possibility of passage of legislation enabling school districts to pay costs of liability insurance protection for teachers, not only in industrial arts, but in other fields in which accidents may occur to pupils.

Dr. Erick Holland of the West Denver high school, made a report on school shop safety and advocated the adoption of a standard state form for shop accident reporting and analysis. He said that the collecting of this report, the compiling of data from the reports and analysis should be a function of the state department of education.

Shop safety had its start in industry, Dr. Holland said, and industry has found that safety has a definite correlation to production efficiency. Safety is wise management and is a part of good management, he said.

COMING CONVENTIONS

Sept. 24–25. Ohio Vocational Association, at Southern Hotel, Columbus, Ohio. Secretary, Ralph J. Woodin, Ohio State University, Columbus, Ohio.

Oct. 18–22. National Safety Council, at Conrad Hilton Hotel, Chicago, Ill. Secretary, R. L. Forney, 425 N. Michigan Ave., Chicago 11, Ill.

INDIANA INDUSTRIAL EDUCATION ASSOCIATION

Officers for the Indiana Industrial Education Association for 1954–55 are: president — Prof. Ammon Swope, Purdue University, West Lafayette, Ind.; vice-president — John Hinds, High School Bldg., Elwood, Ind.; secretary-treasurer — H. G. McComb, 215 State House, Indianapolis, Ind.

PI CHAPTER — IOTA LAMBDA SIGMA INITIATES

On March 23, the following industrial education majors were initiated in Pi Chapter of Iota Lambda Sigma at Northwestern State College: Louis Prudhomme, Lester Mut, Charles Norris, and Jerry DeYeide. The local chapter voted to award annually a $25 Savings Bond to the industrial education major making the highest four-year scholastic record. The same award was also decided upon by the group for the high school student making the highest score on the fourth annual industrial education awards contest held on the campus.

29TH ANNUAL CONFERENCE OF THE PRINTING TEACHERS

At the convention held by the International Graphic Arts Education Association July 4–9, 1954, at the University of Colorado, Boulder, Colo., the following officers were elected for the year 1954–55.

Kenneth R. Burchard, assistant dean of the School of Printing Management of Carnegie Institute of Technology, Pittsburgh, Pa., was elected president.

Other elected officers are: vice-president, Otis H. Chidester, head, printing department, Tucson Senior High School, Tucson, Ariz.; secretary, Charles E. Kennedy, director, Southern School of Printing, Nashville, Tenn.; and treasurer, Vincent C. Coyne, head, printing department, Middlesex County Vocational School, New Brunswick, N. J.

(Continued on page 6A)

Where will he learn high speeds... close tolerances?

In industry, where progress is measured in pay checks instead of report cards, all students don't start even. Some already have the knack of working with fine production tools. High speeds . . . close tolerances . . . are things they don't have to learn *after* they get a job.

The tools they're trained on make a difference!

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Today . . . write, on your school letterhead, for catalogs, prices and the name of your local Cincinnati Lathe dealer. Cincinnati Lathe & Tool Co., 3214 Disney, Cincinnati 9, Ohio.

ASSOCIATION NEWS

(Continued from page 4A)

DR. JARVIS HONORED BY E.P.T.

Dr. John A. Jarvis, dean of the division of industrial education at The Stout Institute, has been awarded the Laureate Citation of Epsilon Pi Tau, international honor society in industrial arts and industrial-vocational education.

The citation reads as follows:

"A notable career as master craftsman, scholar, teacher, organizer, and dean of the industrial education division at The Stout Institute in Menomonie, Wis., for a distinguished war record in the United States Navy during World War II, and for an exemplary trusteeship of the Theta Chapter (at Stout Institute) of Epsilon Pi Tau."

WILLIAM N. LATHROP ELECTED PRESIDENT

William N. Lathrop, Wauwatosa, Wis., a counselor at the Milwaukee Vocational School, was elected president of the Wisconsin Association of Vocational and Adult Education, on May 8, 1954. The group met at Manitowoc.

TEXAS VOCATIONAL ASSOCIATION

The newly elected officers of the Texas Vocational Association for the 1954–55 year are as follows:

H. D. Bearden, president. Mr. Bearden is assistant to the vice-director, Texas Engineering Extension Service, The A. & M. College of Texas, College Station, Tex.

Mrs. Nanalee Clayton, vice-president at large. Mrs. Clayton is a professor of homemaking education at Sam Houston State College, Huntsville, Tex.

Leland B. Luchsinger, secretary-treasurer. Mr. Luchsinger is specialist in industrial preparatory training and also serves as state adviser of the Vocational Industrial Club of Texas. He is employed at the Industrial Education Department, Division of Extension, The University of Texas, Austin, Tex.

H. W. Gist, vice-president of agriculture. Mr. Gist is teacher of agriculture in Sinton High School, Sinton, Tex.

Homer Bronstad, vice-president for business and distributive education. Mr. Bronstad is co-ordinator of distributive education, Denton Senior High School, Denton, Tex.

Miss Lucy V. McRoberts, vice-president of the guidance division. Miss McRoberts is a teacher in Technical High School, Fort Worth, Tex.

Dr. Geraldine Clewell, vice-president of the homemaking division. Dr. Clewell is professor of homemaking at Texas Technological College, Lubbock, Tex.

Sam R. McCluney, vice-president of the industrial-arts division. Mr. McCluney is supervisor of industrial arts in the Houston Public Schools, Houston, Tex.

James S. Gupton, vice-president for trade and industrial education. Mr. Gupton is director of vocational education and is employed by the Houston Public Schools. — *Leland B. Luchsinger.*

INDUSTRIAL ARTS OFFICERS NAMED

William Hagmeyer of Jamaica High School, New York City, has been elected president of the Association of Teachers of Industrial and Practical Arts in Day High School.

Other officers are Charles Abadie, Evander Childs High School, vice-president; Raymond C. Fish, Tilden High School, secretary; Morris Dickstein, Manual Training High School, treasurer.

MILWAUKEE INDUSTRIAL ARTS TEACHERS MEET

On May 12 the Milwaukee Industrial Arts Teachers' Association held their annual awards dinner at the Lutheran Center. The dinner was in honor of those retiring: Ed. Berg, Joe Rauh, and John Dunlop, and those having completed 25 years of service: Otto Northquest, LeRoy Penniston, Edgar Held, and Reuben Charette.

The officers for the coming year are Reuben Charette, president; Melvin Olson, vice-president; Darrel Redgren, secretary-treasurer; and Darrel Lemke, committeeman. Wayne K. Pool is the retiring president.

W.A.V.A.E. ELECTS

The Wisconsin Association of Vocational and adult education elected the following officers for the year 1954–55: president, William N. Lathrop, Milwaukee, Wis.; vice-presidents, Arnold Bluemke, Marshfield, Wis., and Alfred R. Meier, Milwaukee, Wis.

♦ The 1954, Four-States Regional Industrial Arts and Vocational Education Conference will be held at the Kansas State Teachers College, Pittsburg, Kans., Friday and Saturday, October 1 and 2. Preparations are under way for an exceptionally strong program this year. All interested individuals are invited to attend. — J. V. Melton, *Secretary.*

NEW "DYNO-MITE" POWER WOOD BITS with high-speed steel blades. Stay sharp 10 times longer than ordinary tool-steel bits — even cut through wire nails and screws. Start readily even at angles. 6 sizes from ⅛" to 1". Separately or in sets of 4 or 6. Set No. 8006 shown. $6.45

BUFFING AND SANDING ATTACHMENT for any ¼-inch electric drill. Two speeds — 1 to 2 or 2 to 1 drill speed. Sturdy and smooth-running with machine-cut steel gears and grease-sealed lubrication. Exclusive 100° angle drive. No. 2120 complete with 5" rubber pad, two 5" sanding discs and 5" lambswool bonnet $8.45

RIGHT-ANGLE DRIVE to fit all ¼-inch electric drills with ⅜-24T spindles. Requires no adapter — uses chuck of drill to which it is attached. Permits work in corners, between studs, in many spots where drill cannot be used direct. Gear ratio 1 to 1. Steel gears — grease-sealed lubrication — Oilite bearings. No. 2130. . . . . $4.95

NEW JIG SAW ATTACHMENT for all ¼-inch electric drills. Cuts wood, metal, plastics, etc. Capacity 2" in wood, ⅛" in metal. Makes its own starting hole in wood. Automatic air blast keeps cutting line clear of chips and sawdust. Universal joint drive assures maximum power transmission. Complete with 2 metalcutting and 2 woodcutting blades. No. 2140. . . . $10.95

POWERFUL NO. 1814 "DYNO-MITE" DRILL Conservatively rated at 1.7 amps. Ruggedly built for dependable, long-lasting performance year after year. Palm-fitting pistol grip and straight-line trigger switch with automatic release. An outstanding value in every way. No. 1814 with Jacobs Geared Key Chuck. $22.35

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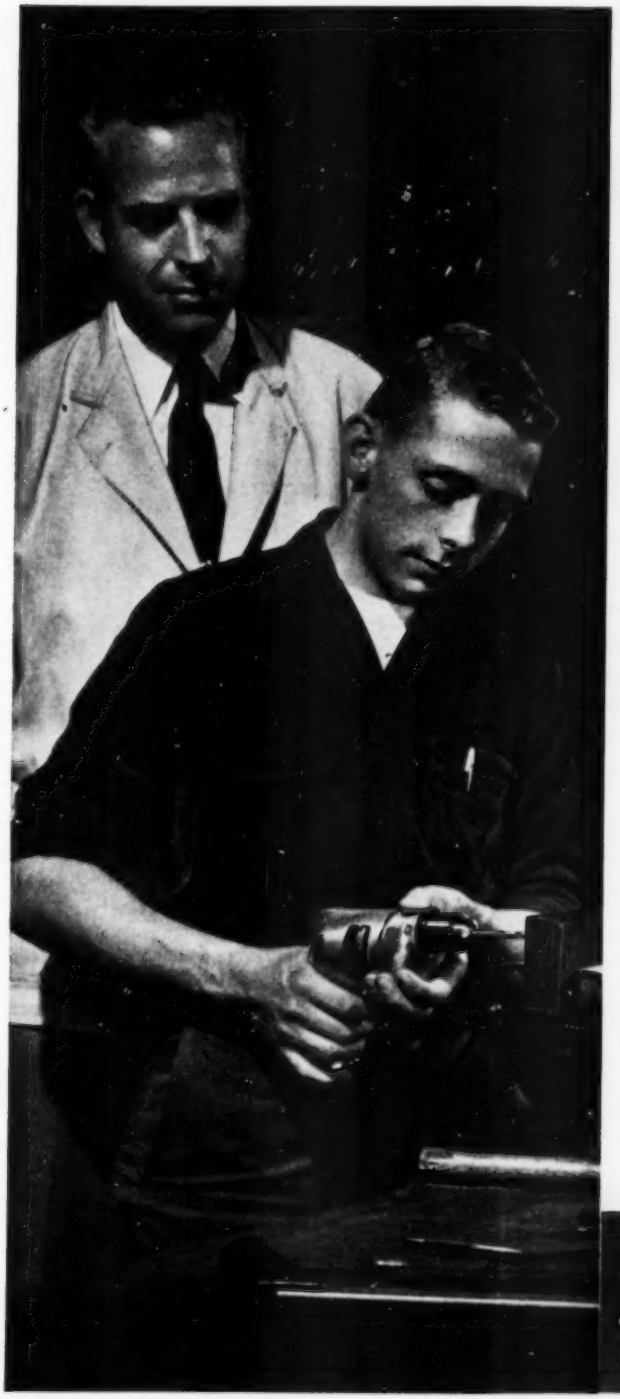

Easier to teach–
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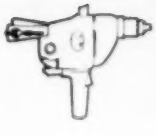
TEACHING . . . or learning . . . any job is *easier* when you have the proper tools. That's why teaching students with Black & Decker Drills makes such good sense. B&D Drills are the finest made. They're supplied to industry in capacities from ¼" to 1¼" in steel, so you're sure to find the exact model that suits your teaching needs best! You choose the handle style and speed you want, too. What's more, your students appreciate the way B&D Drills handle—they're husky, compact, and equipped with safety devices that cut down beginner nervousness. And finally, your students get a real break, since graduates find the same B&D Drills on the job that they used in class!

Remember—*B&D Tools cost you less in the long run because they outlast cheaper types!* See your nearby B&D Distributor for complete details, or write for free catalog to: THE BLACK & DECKER MFG. CO., 616 Pennsylvania Ave., Towson 4, Md.

B-D Black & Decker PORTABLE ELECTRIC TOOLS

SANDERS

SCREW DRIVERS

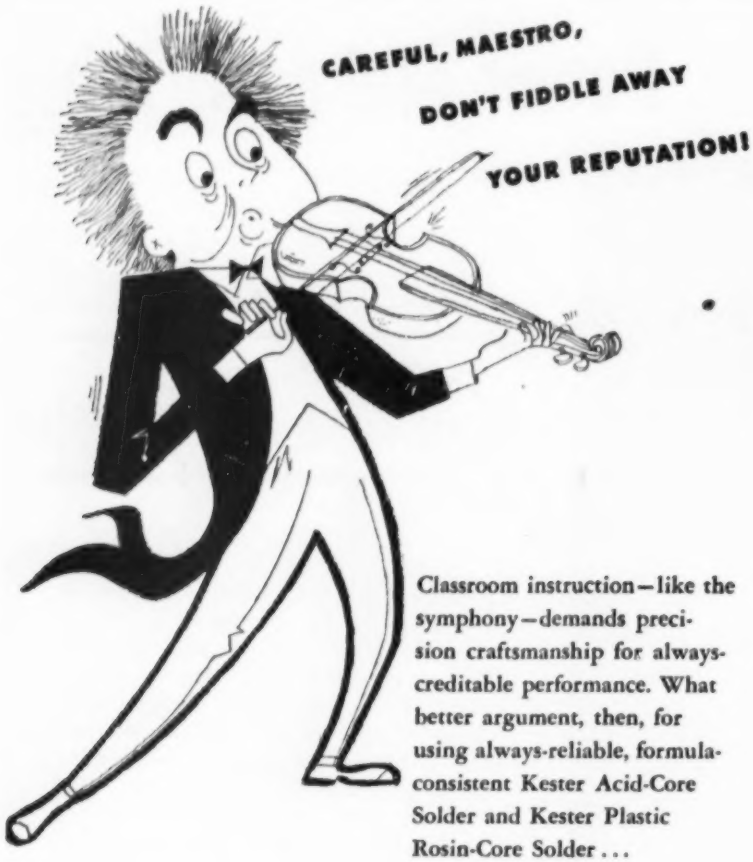


DRILLS

BENCH GRINDERS

VALVE REFACERS

VALVE SEAT GRINDERS



Classroom instruction—like the symphony—demands precision craftsmanship for always-creditable performance. What better argument, then, for using always-reliable, formula-consistent Kester Acid-Core Solder and Kester Plastic Rosin-Core Solder . . . star performers for more than 50 years!

FREE! Write today for the Kester Soldering Manuals . . . one for the instructor and one for the student.

KESTER

SOLDER COMPANY

4257 WRIGHTWOOD AVENUE, CHICAGO 39, ILLINOIS
NEWARK 5, NEW JERSEY; BRANTFORD, CANADA

Personal News

JOHN F. FABER DIES

John F. Faber, eastern manager of The Bruce Publishing Company, died unexpectedly Sunday morning, June 27, at his home in Lynbrook, L. I., N. Y.

Mr. Faber was born February 18, 1893, in Oswego. He attended public elementary and high schools there. He was a graduate of State Teachers College at Oswego and the University of Pittsburgh, receiving a bachelor of science degree from the latter in 1921. Before entering the employ of The Bruce Publishing Company, he taught industrial arts and was night principal at Academy High School, Erie, Pa.

John F. Faber

He entered the employ of The Bruce Publishing Company as a textbook salesman in 1929. In October of the same year he became an advertising space salesman for the three Bruce magazines, *The American School Board Journal, Industrial Arts and Vocational Education,* and *The Catholic School Journal.* In 1930 he was named eastern manager in charge of advertising, textbook, and trade book sales.

Mr. Faber was a veteran of World War I, having enlisted as a private in 1918. He is the author of several industrial-arts texts published by Bruce, among them: *Mechanical Drawing Problems, Problems for Mechanical Drawing and Blueprint Reading, A Treatise on Dimensioning, Vertical Wall Lettering Chart, Inclined Gothic Lettering Wall Chart,* and *Freehand Lettering Scale.*

He is survived by his wife, Florence Dailey Faber, and three children: a son, Jack, who is an employee of The Bruce Publishing Company; two daughters, Mrs. William McCarthy of Hicksville, N. Y.; Mrs. James Stewart of San Antonio, Tex.; and several grandchildren.

He had been with The Bruce Publishing Company for 25 years.

ED WILLIAMS DIES

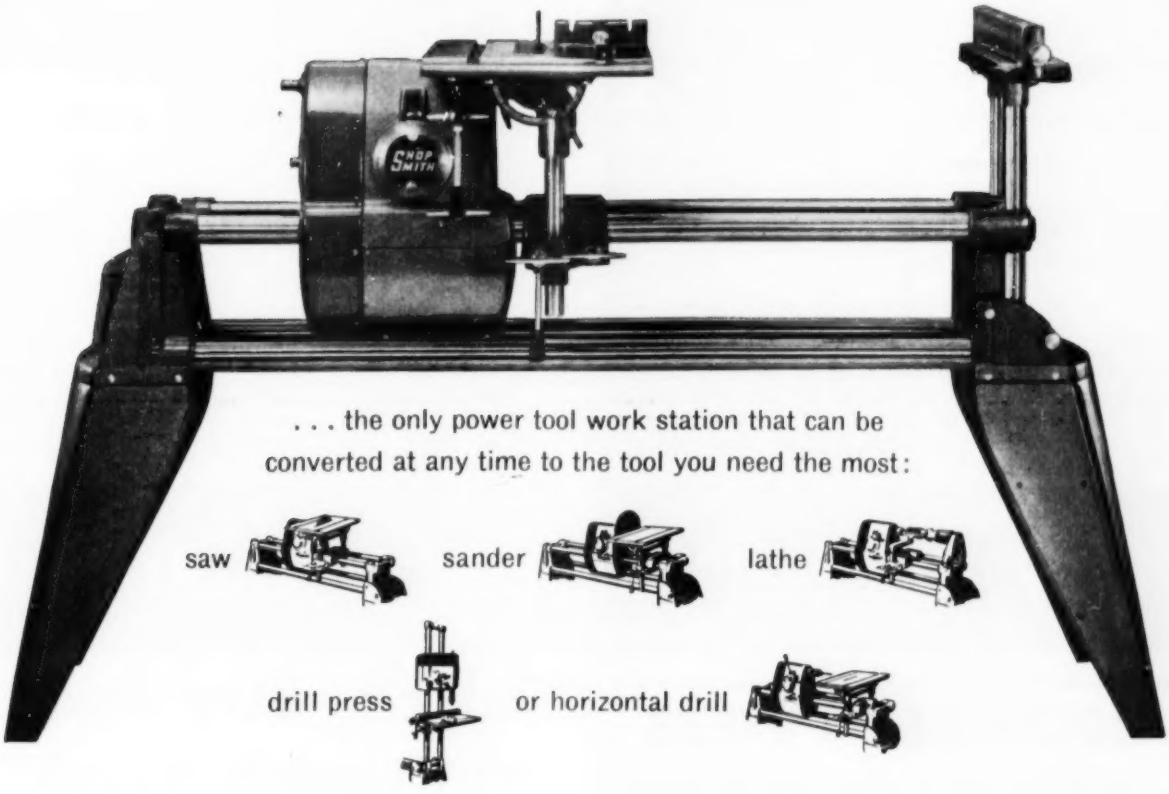
Edward Lafayette (Ed) Williams, one of the pioneers of industrial-vocational education in America, who became one of the best-known men in his field during his nearly 30 years at the A. and M. College of Texas, retired on June 1 because of a serious illness. He died on June 14, 1954.

His retirement as vice-director of the Texas Engineering Extension Service of the Texas A. and M. College system marked the close of an important era in the vocational education field.

(Continued on page 22A)

HERE'S YOUR NEW SHOPSMITH*

FLEXIBLE WORK STATION



. . . the only power tool work station that can be converted at any time to the tool you need the most:

saw
sander
lathe
drill press
or horizontal drill

Magna Engineering Corporation, which pioneered the idea of the flexible shop, now makes it more useful than ever before with a brand-new SHOPSMITH*! It's the most versatile, most accurate, largest capacity and easiest to operate multi-purpose tool available for school shop use!

New SHOPSMITH eliminates periodic overloads, lets you convert an idle tool to an active one in less than 60 seconds! It saves floor space and money because you can teach more effectively with fewer work stations.

Only SHOPSMITH gives you as many saws as you need one day, as many lathes as you want the next, and as many horizontal drills, drill presses and sanders as you require on succeeding days.

Price complete, except for school saw guard and miter gauge safety grip, **$269.50**

MOST VERSATILE TOOL you ever saw! Power mount lets you add a jointer, jigsaw, bandsaw, etc., with a twist of a handle and a turn of a set screw. Exclusive Speed-Dial insures correct speed for every operation because you simply dial the job—no belts or pulleys to change. And—you can change from any of SHOPSMITH'S five basic tools to another in less than 60 seconds!

GREATEST CAPACITY of any power tool on the market! For example, you can rip a standard 8' plywood panel exactly in half—either way! New SHOPSMITH has husky ¾-hp. motor . . . 9" circular saw . . . 16½" swing lathe . . . 12" sanding disc . . . 14" x 18⅜" table . . . drill press that drills to center of a 16½" circle . . . unlimited capacity in horizontal drill.

SAFEST TOOL ever invented! Safety grip on miter gauge keeps hands away from saw blade, prevents work "creepage." New saw guard covers top and bottom of blade. Motor is fully enclosed; no exposed belts! New switch can be knocked off accidentally, but not on!

MAGNA ENGINEERING CORPORATION
Dept. 271-U, *at factory nearest you*
12819 Coit Rd., Cleveland 8, Ohio, OR
Menlo Park, California

SHOP SMITH

I'm interested! Rush me your free 20-page catalog on the NEW SHOPSMITH. Also the name of my nearest dealer.

*Name*_____

*Address*_____

*City*_____ *State*_____

*Trademark Reg. U. S. Pat. Off. and in foreign countries.

AT LAST

IT'S SENSATIONAL
BY POPULAR DEMAND

IT'S HERE

MODEL E-16-D

DIRECT DRIVE MOTOR

CUTTERHEAD SPEED 3600 R.P.M.

4" DIAMETER CUTTERHEAD

SEALED CUTTERHEAD BEARINGS

FEED RATE 15 to 37 FPM

ALL CAST IRON CONSTRUCTION

TABLE LOCKING HANDWHEEL

DYNAMICALLY BALANCED CUTTERHEAD

POWER DRIVEN FEED ROLLS

MICROMETER KNIFE SETTING

Powermatic proudly presents its most sensational machine in over 25 years of manufacturing experience. The Model E-16D, Direct Drive 16" single surfacer, was created by popular demand and this twin sister to the E-16 Belt Driven machine offers performance plus; the cabinet makers' dream, the production plants' ideal. If you desire year after year of troublefree service, by all means check the performance and quality of this machine before you make *any* decision. Write for complete information.

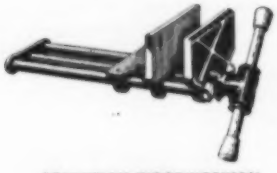
Manufactured By

POWERMATIC MACHINE COMPANY

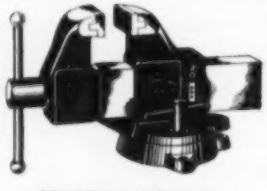
McMINNVILLE, TENNESSEE

COLUMBIAN VISES

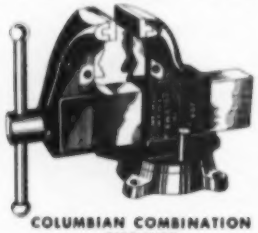
. . . vises for every need and purpose!



COLUMBIAN WOODWORKERS' VISE



COLUMBIAN MACHINISTS' VISE



COLUMBIAN COMBINATION PIPE VISE

COLUMBIAN HINGED PIPE VISE

For over 65 years Columbian has stood for finest quality in vises—strong, dependable, backed by an iron-clad guarantee.

A-6491

COLUMBIAN Vises

The Columbian Vise & Mfg. Co.

CLEVELAND 4, OHIO

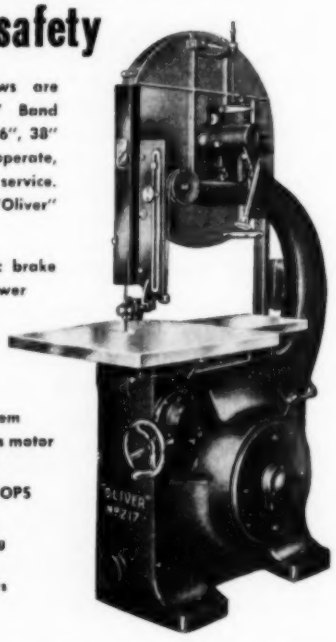
MANUFACTURER OF COLUMBIAN-STEVENS LEVELS

"OLIVER" Band Saws

give you smooth, accurate work with safety

Industry's favorite Band Saws are right for teaching. "Oliver" Band Saws are made in 18", 30", 36", 38" sizes. They are easy to operate, and are built for rugged service. Note these features of the "Oliver" 30-inch Band Saw:

- Upper wheel has automatic brake
- Shut-off foot brake for lower wheel
- High-speed ring-disk wheels run true at all speeds
- Self-locking table tilts 45° to right, 10° left
- Efficient dust-collecting system
- Heavy one-piece frame keeps motor arbor permanently aligned



"OLIVERS" FOR SCHOOL SHOPS

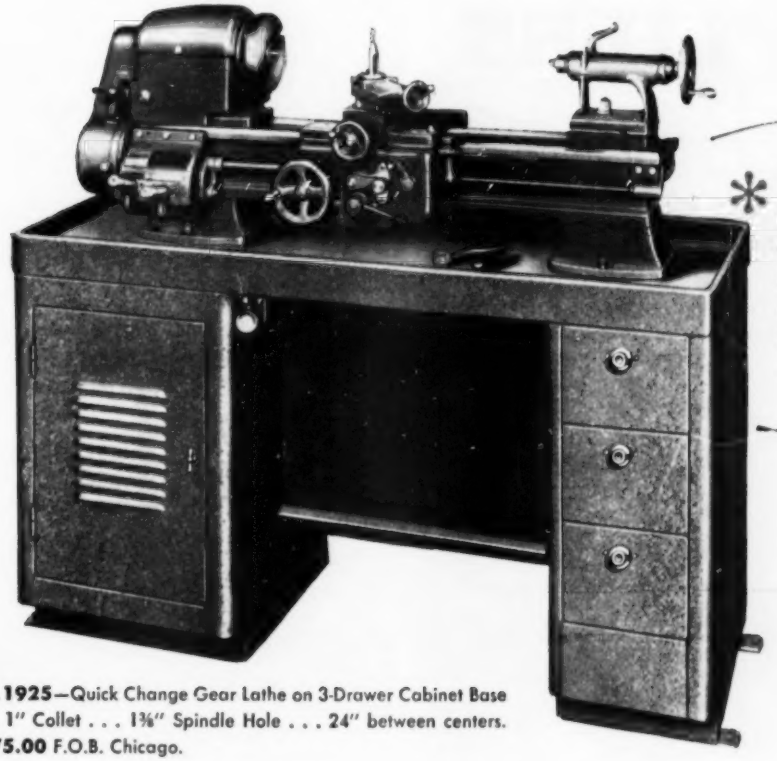
Boring Machines	Shapers
Circular Saws	Speed Lathes
Jointers	Metal Spinning Lathes
Jig Saw	Tool Grinders
Mortisers	Wood Trimmers
Planers	Tenoner
Sanders	

Write for Bulletins

OLIVER MACHINERY CO., GRAND RAPIDS 2, MICH.

Industrial Type Projects

Are easily handled in school shops on this 11" swing Logan Lathe*



* *One of the many in the complete Logan Line of 9", 10", 11" and 12" swing Lathes, and 8" Shapers.*

No. 1925—Quick Change Gear Lathe on 3-Drawer Cabinet Base . . . 1" Collet . . . 1⅜" Spindle Hole . . . 24" between centers. **$875.00** F.O.B. Chicago.

Student interest in shop work is sharply stimulated by the wide range of challenging projects this 11" lathe permits. With its 1" collet capacity, 1⅜" spindle hole and 24" centers, the "1955" turns work of substantial size. Furthermore, it enables your students to learn on one of American industry's standard modern lathes.

Advanced design and rugged, accurate, safe construction make the 1955 an ideal training lathe. The spindle revolves on preloaded *ball* bearings of extreme precision that need no adjustment for any speed in the full range of 45 to 1500 rpm. The rugged, balanced special alloy bed has two V-ways and two flat ways precision ground. The automatic apron, double-walled and friction-free, with spline-driven power cross feed, has a convenient, lever-operated disc type clutch. V-belt drive, headstock, countershaft and motor are enclosed. Controls and switches are easily accessible. The low price, resulting from efficient production in the modern Logan plant, places the 1955 within range of the modest school budget.

Brief Facts

Collet Capacity, 1"

Spindle Hole, 1⅜"

Swing over bed, 11⅛"

Center Distance, 24"

Bed Width, 6 15/16"

Ball Bearing Spindle

16 Spindle Speeds, 45 to 1500 rpm

Double V-belt Drive for extra power to spindle is completely enclosed

Threads—48 selections, RH or LH—4 to 224 per inch

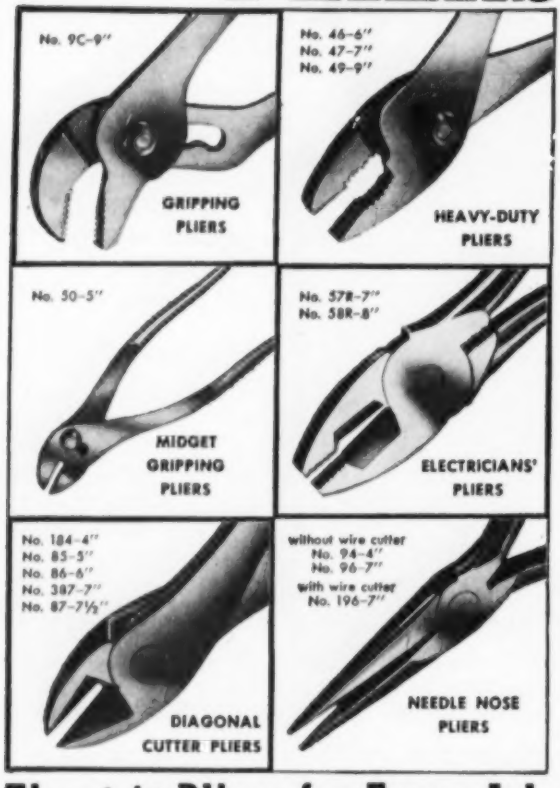
Write for the Logan Lathe Catalog

Logan ENGINEERING CO.

Lawrence and Lamon Avenues, Chicago 30, Illinois

LOOK TO Logan FOR BETTER LATHES AND SHAPERS

Snap-on* Vacuum Grip PLIERS



The *right* Pliers for Every Job

With pliers that are *right* for the job, students learn to perform each gripping, cutting, twisting operation *faster, easier, more safely!* Choose your shop assortment from Snap-on's complete range of more than 30 types and sizes. Snap-ons are built to deliver years of superior performance. Each is heat treated from surface to core and the jaws, cutting edges and joints are locally tempered to exact degree of hardness and toughness for greatest durability. Snap-on Vacuum Grip Pliers are described in the 104-page Snap-on Catalog—sent free to school officials and shop instructors.

SNAP-ON TOOLS CORPORATION

8074-I 28th Avenue • Kenosha, Wisconsin

*Snap-on is the trademark of Snap-on Tools Corporation

DELIVERY: NOW

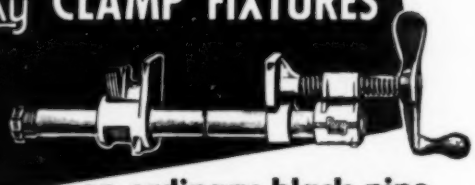
V2-D . . . DOUBLE WORK BENCH. 52" long x 36" wide x 32" high. Two working sides, each equipped with vise, adjustable bench stop, movable bench dog, and tool drawer.

SJÖSTRÖM WORK BENCHES

JOHN E. SJÖSTRÖM COMPANY, INC.

1712 NORTH TENTH STREET, PHILADELPHIA 22, PA.

make economical bar clamps by mounting "Pony" CLAMP FIXTURES



on ordinary black pipe.

The famous, original "PONY" Clamp fixtures that assemble quickly on regular pipe threads. Make low cost clamps of any length. Fast-operating — sure holding. "Multiple Disc Clutch" adjusts instantly up to work. Available in several styles, for ½" or ¾" pipe. See your dealer or write.

"Jorgensen" and "Pony" "C" Clamps

For greatest value . . . "JORGENSEN" Style No. 120 **deep throat**, and Style No. 1 "Jorgensen" "C" Clamps, **regular throat**. Designed for greatest strength and balance. Surprisingly low priced . . . long life. "PONY" small "C" Clamps in many sizes for endless uses. Write for . . .

free catalog of Bar Clamps, Handscrews, Press Screws, etc.

ADJUSTABLE CLAMP CO.

424 No. Ashland Ave. • Chicago 22, Illinois

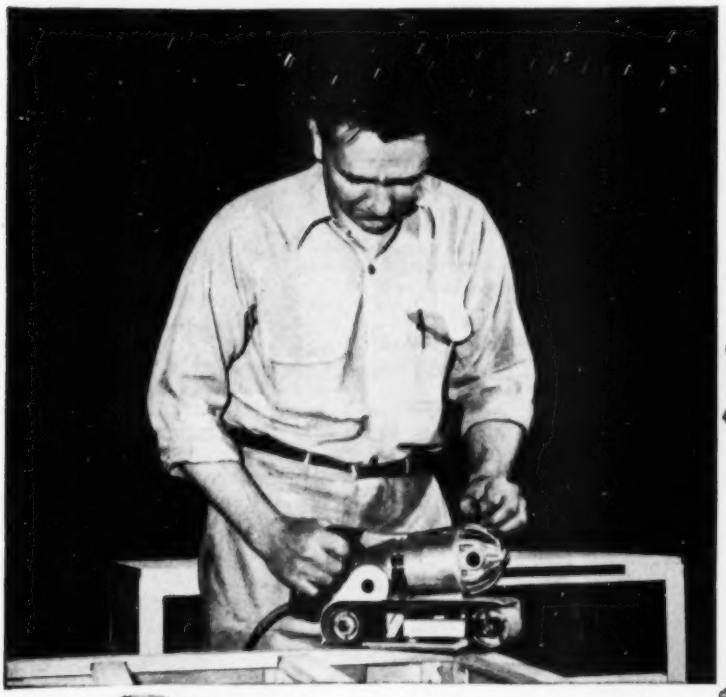
SKIL Tools do double duty in training . . . in school maintenance

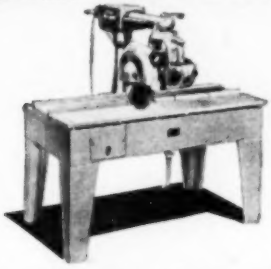
What could be more logical than to equip the student in his classroom with the tools he'll use as a professional?

Double duty SKIL tools in training and also in school maintenance. Students learn quickly—and safely—by using the same SKIL tools that are the standard of industry everywhere.

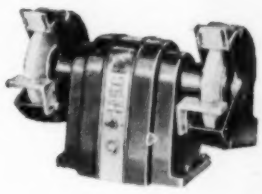
And your *maintenance* crew will save time and money on miscellaneous repairing and general building upkeep.

Act *now*. Be sure to get the complete story from your distributor on what SKIL portable tools can do for *your* school—in training, in maintenance—today!





SKIL Radial Saws are *safest!* Controls are in *front*. Retractable arm clears work area. Sturdy blade guard adjusts easily. Controls recessed to prevent accidental starting. 2, 3 and 5 h.p., with 14" and 16" blades, 1 or 3 phase, all voltages, manual or magnetic control. A "must" for the maintenance shop; valuable in woodworking classroom.



New SKIL 6" Bench Grinder—Model 246. Indispensable for training and maintenance of cutting tools. New safety pilot light—an exclusive SKIL feature—prevents accidents where many people operate this tool. Lowest priced grinders with fully enclosed wheels, exhaust chutes, adjustable tool rests—all important safety features.

SKIL Belt Sanders Finest for Fast Finishing at Lowest Cost

The most popular tool for rough or fine sanding of wood, metal, stone, composition and other materials. Perfect for instruction in the art of fine finishing. The tool that will save the most time and money on refinishing desks and blackboards, and in general school maintenance. Belt width from 2¼" to 4½". Five models.

SKIL 3" Electric Plane Answers All Needs for both accurate Edge or Surface Planing.

Cog-belt drive requires no lubrication—important where *many* people use a tool and depend on others for maintenance. Sharpening is simple and quick with an inexpensive SKIL attachment. Weighs a third less than comparable planes, sturdy and dependable.

The Wide Range of SKIL Drills—26 Models—Assures the Exact Power and Capacity for all School Needs.

Capacities up to 1" in steel, 2" in hardwood. Motors are reserve-powered, ideally balanced for easier use by the student or maintenance man. Optional speeds. Complete line of accessories, including drill stand to make low-cost, accurate drill press.

SKIL PORTABLE TOOLS

SKIL Corporation, Dept. IA-94
5033 Elston Avenue, Chicago 30, Illinois

☐ I would like a demonstration and free trial
☐ Please send literature on SKIL tools

NAME_____

STREET_____

CITY_____ ZONE____ STATE_____

FREE! Ask your distributor for a demonstration and a FREE trial—of SKIL tools!

Made only by SKIL Corporation
formerly SKILSAW, Inc.
5033 Elston Avenue, Chicago 30, Illinois • 3601 Dundas Street West, Toronto 9, Ontario
Factory Branches in All Leading Cities

Your Students Will Learn FASTER on a PARKS PLANER

The PARKS No. 20
20" PLANER

Students advance quickly on Parks Planers because they find them easy to operate, safe, and accurate. And, since both the Parks 12" and Parks 20" Planers have been designed and precision-built for accuracy and high-speed line production in industry, they are ideally suited for the school shop because they give practical experience on the type of machines your students will eventually use. Both machines are priced low enough for even the most modest shop budget.

The Parks No. 20. 20" Planer has a 4-knife cutterhead with a speed of 3600 R. P. M. and offers two feed speeds—20 and 40 F. P. M., and 40 and 80 F. P. M. Will take work up to 20" wide by 6" thick. Ruggedly built for vibrationless operation.

The Parks Heavy-Duty 12" x 4" Planer. A compact, sturdy thickness planer that offers mill planer precision at low price. Has feed speed of 16 F. P. M. at 4000 R. P. M. Will handle material as short as 6" and as thin as 1/16".

Write for complete descriptive literature.

Manufacturers of Quality Woodworking Machines since 1887.

The PARKS
Heavy-Duty
12" x 4" PLANER

The PARKS WOODWORKING MACHINE CO., Dept. 24-C9, 1546 Knowlton St., Cincinnati 23, Ohio

Students learn easier, work more safely and more accurately when their eyeglasses are SIGHT SAVER clean. Install SIGHT SAVER Cleaning Stations in your shop. Promote safety, reduce waste by making it easy for students to keep eyeglasses clean. Low cost Sight Saver Cleaning Stations are easy to install—dispense one 3" x 7" tissue at a time. Each tissue is scientifically treated with SILICONES. Thousands of industrial plants and millions of people use Sight Savers to clean, polish and protect glass lenses.

Available from leading Safety Supply Houses

Cat. No. 60 Black Dispenser – $2.50
Cat. No. 61 White Dispenser – $2.50
Cat. No. 62 Green Dispenser – $2.50
Cat. No. 65 Refill Packet contains 800 tissues – $1.45

* Write Dept. BX-21 for name of Safety Supply Houses in your area

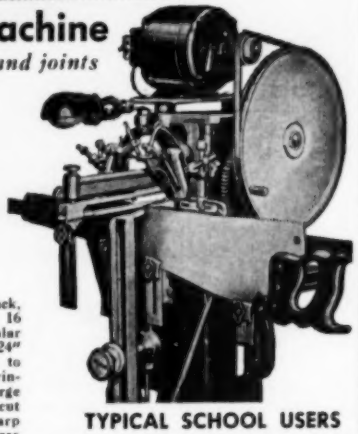
DOW CORNING CORPORATION
Midland Michigan

SAW FILING

This ONE Machine

automatically files and joints

HAND, BAND, CIRCULAR SAWS



The Foley Saw Filer is ideal for sharpening saws used by students in school shops. It keeps them in tip-top shape, faster and better than by hand filing. Used by Army, Navy, hundreds of manual training departments and industrial plants. The Foley is the only machine that files and joints all hand, back, and mitre box saws from 3 to 16 points per inch, crosscut circular saws up to 16" diameter (24" optional), and band saws up to 24' long. Patented jointing principle automatically evens up large and small teeth, so saws cut faster, truer, cleaner — stay sharp longer. Foley filed saws have less breakage and last longer.

30-DAY TRIAL OFFER

You may have the privilege of using the Foley Saw Filer in your own shop for 30 days. Write or send coupon for details and list of school users.

TYPICAL SCHOOL USERS

Berea College, Berea, Ky.; Board of Education, Cleveland, Ohio; Boys Technical H. S., Milwaukee, Wis.; Charleroi School District, Charleroi, Pa.; Redlands Public Schools, Redlands, Calif.; Stout Institute, Menomonie, Wis.

FOLEY *Automatic* SAW FILER

FOLEY MFG. CO., 3318 N.E. 5th St., Minneapolis 18, Minn.
Please send information and Trial Offer on Foley Saw Filers.

Name.....

Address.....

School.....

Start your students off right

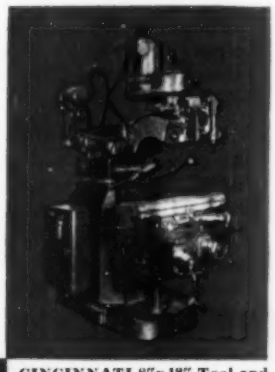
train them on Cincinnatis

the machines used in industry

So widespread is the use of Cincinnati Milling, Grinding, and Cutter Sharpening Machines in industry, that wherever your students go to work they are sure to encounter machines designed and built by Cincinnati Milling. That's why these general-purpose machines are so desirable for school shops, and graduates trained on them make the transition from the classroom to a job with a minimum of additional instruction. Cincinnatis are safe, easy to operate, and built to withstand rough handling by inexperienced trainees. Write for catalogs. They will be sent free to instructors and those responsible for selecting school shop equipment. Please ask for them by number.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

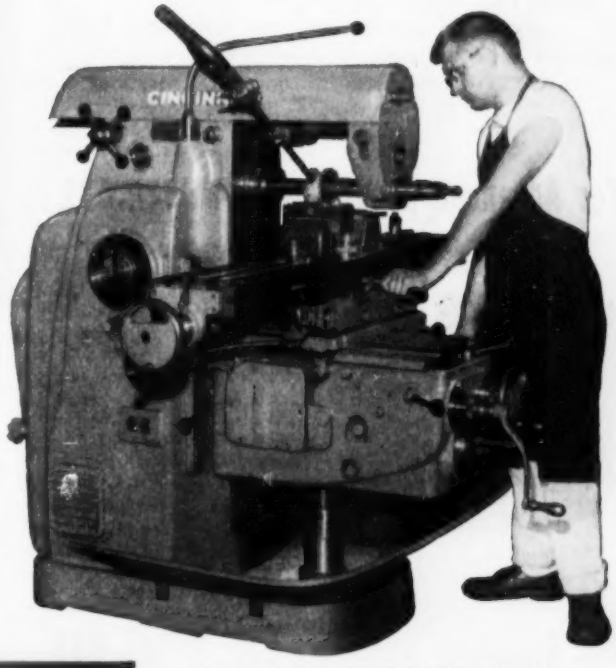
CINCINNATI



CINCINNATI 8"x 18" Tool and Die Milling Machine. Catalog No. M-1731.

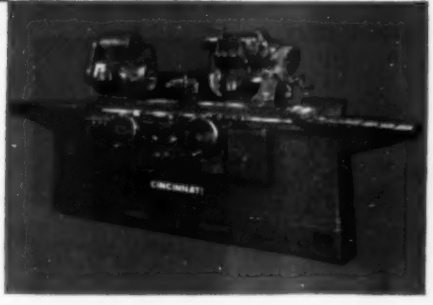
CINCINNATI No. 2 Cutter and Tool Grinder. Catalog No. M-1734.

CINCINNATI FILMATIC 12" x 36" Hydraulic Universal Grinding Machine. Catalog No. G-486-7.



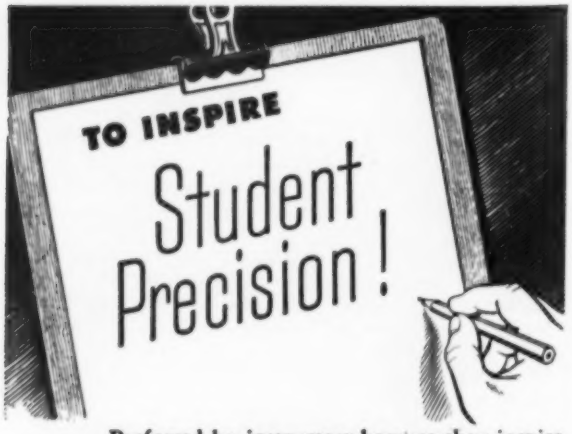
CINCINNATI No. 2ML Plain Milling Machine. The 2MLs and 2MIs offer a choice of two power ratings: 3 hp and 5 hp respectively, and two styles: plain and universal. Catalog M-1662-2.

FILMATIC



CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID • CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES



Preferred by instructors because they inspire students to new achievements . . . WESTON instruments also are the choice of practical administrators because their ruggedness and year after year dependability make their cost remarkably low! Ask for bulletin listing all instruments.

WESTON Electrical Instrument Corporation,
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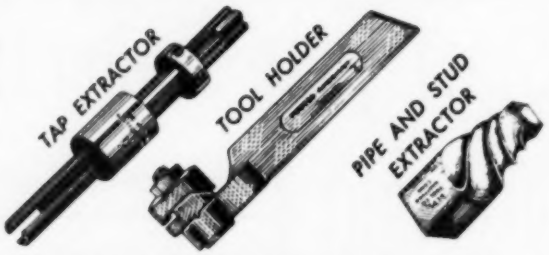

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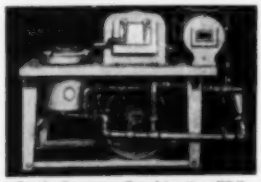

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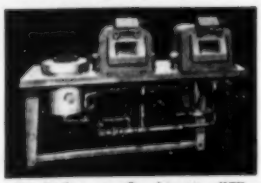

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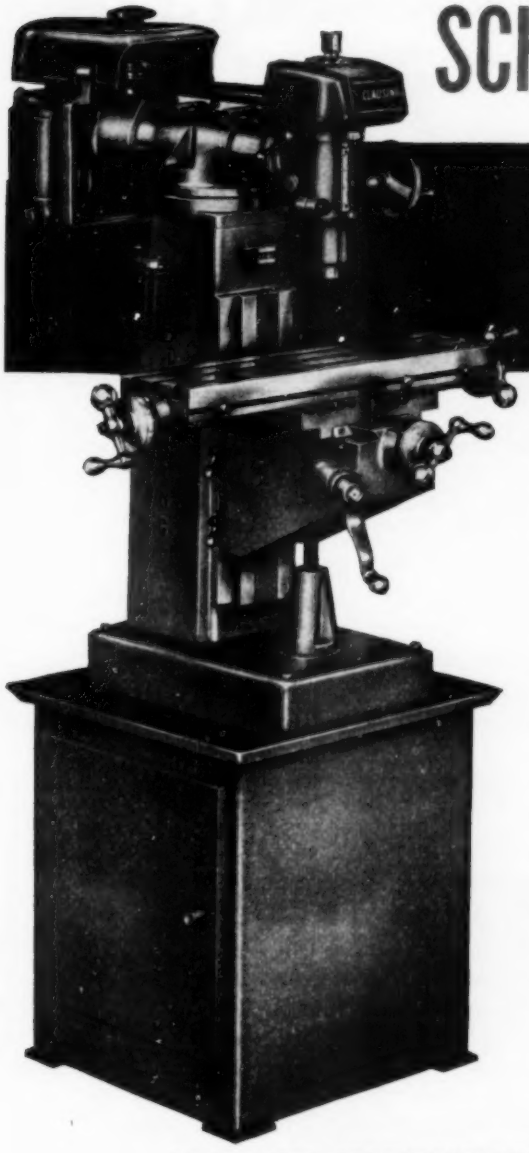

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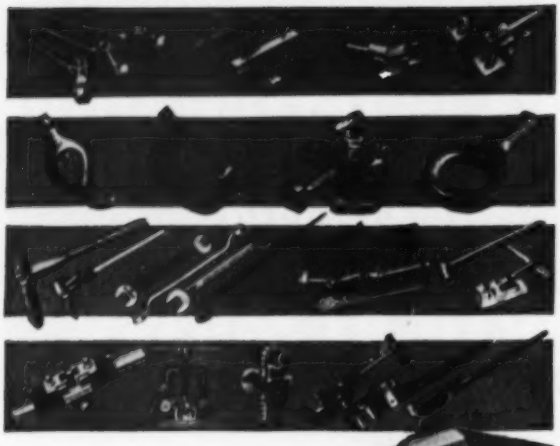

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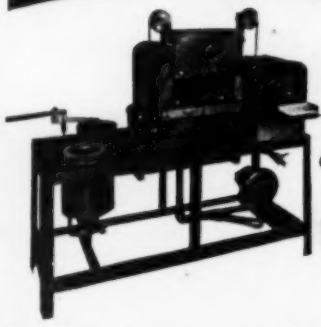

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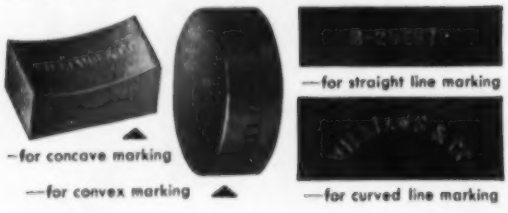

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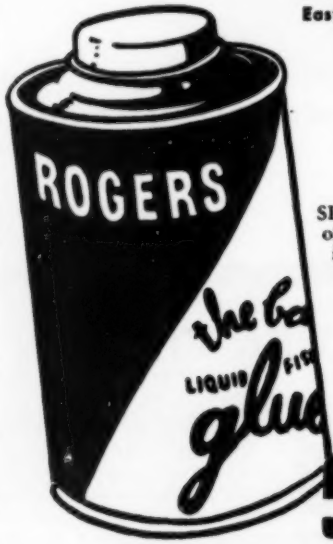

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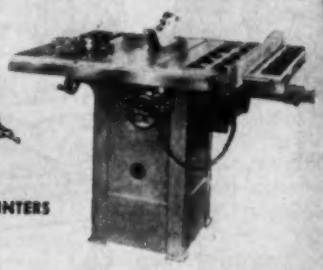

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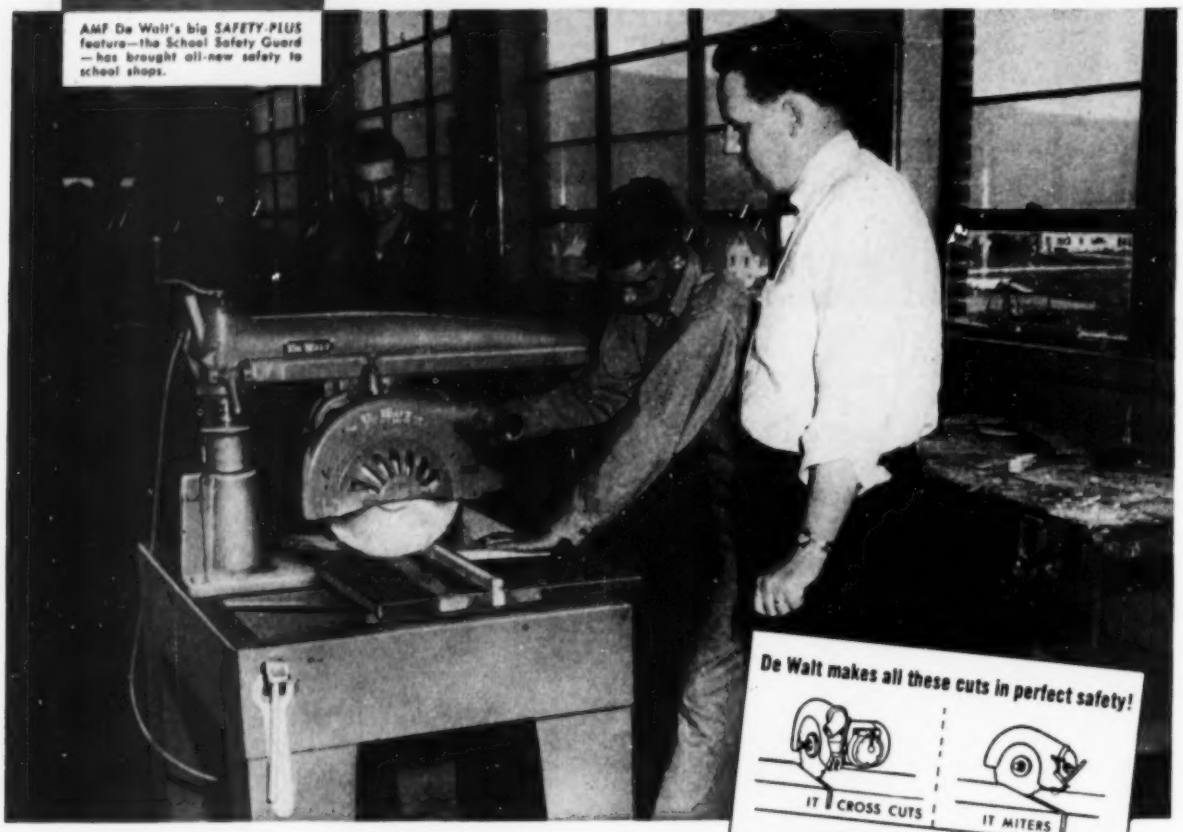

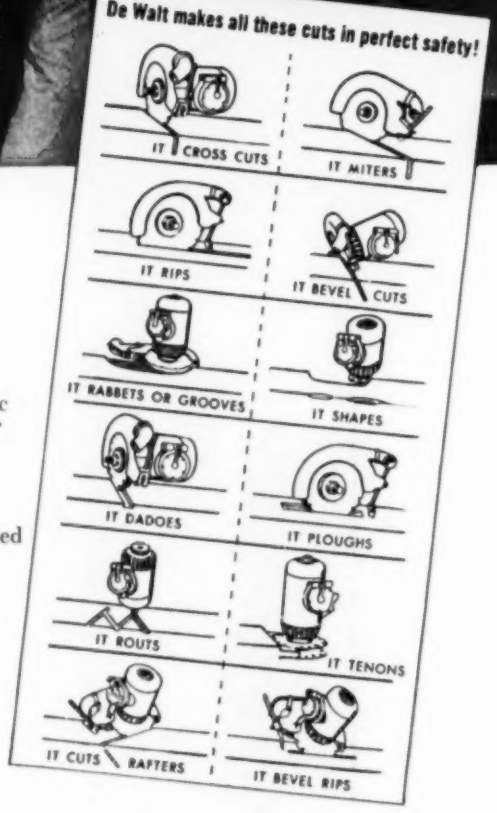

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Industrial Arts and Vocational Education
The Shop Teachers Professional Magazine
SEPTEMBER 1954

Development and Administration

A Student Eye Protection Program

ALFRED S. DREW
School of Vocational and Adult Education
West Allis, Wis.

". . . If a dearth of published material is a criteria, there is evidently little done to safeguard the eyes of students in schools."[1] Judging from the response to the article in which this statement appeared, it seems that many educators are certainly aware of this phase of safety education. At the West Allis School of Vocational and Adult Education, we have received requests for information on sanitizing procedures, and on the types of eye protection equipment being used. Likewise, additional information has been requested on the fitting of glasses, control of equipment, training of personnel, and methods of enforcement. It is apparent that correspondents are very much interested in the development of eye safety programs in their respective schools. In view of this expressed interest, the writer, through the medium of this article, is striving to supply additional details on the day school eye protection program at the School of Vocational and Adult Education in West Allis, Wis. The liberty of utilizing background material extensively in the introductory portion of the article has been taken: (1) to provide the reader with a better understanding of the development of our present program; and (2) to provide educators, inexperienced in this field, with a working knowledge of eye protection practices, so that they may be better prepared to initiate similar programs.

[1]Roy R. Van Duzee, "Eye Protection in a School Safety Program," INDUSTRIAL ARTS AND VOCATIONAL EDUCATION, Vol. 42, No. 7 (Sept., 1953), p. 203.

The Basic Training of This Writer May Suggest a Pattern of Training for Others

The responsibility of administering and further developing the student eye protection program was assigned to this writer in September, 1952. Because of insufficient experience in this field of safety education, a short-term training program was organized. The basic training program included: (1) a visit to a manufacturer of safety eyewear; (2) the home study of manufacturers' safety eyewear catalogs; and (3) a visit to the eye safety department of a local industrial firm.

1. *Visit to a Producer of Eyewear:* The visit to an office of a manufacturer of safety eyewear (C)[2] provided an opportunity to observe production operations in the shop and to discuss eye safety practices with informed representatives. It was evident from the assortment of safety eyewear available that protection against impact hazards is not the sole function of safety goggles. Equipment has also been designed to provide protection against splashes of corrosive liquids, splashes of molten metals, excessive dust, and injurious light energy radiations, such as glare, and the invisible ultra-violet and infra-red rays.

[2]A capital letter in parentheses refers to the source of information listed at the end of this article.

Another interesting fact learned during the shop visit was that even though safety lenses are tested in a manufacturer's laboratory to meet specifications established by the United States Government Bureau of Standards, some of the lenses break when subjected to extreme impact conditions. However, when this happens, the safety lenses usually stay compact. That is, generally, they do not leave the goggle frame. The lenses tend to crumble into cubical particles instead of into dangerously sharp, jagged splinters.

A most enlightening portion of the shop visit involved a presentation of fundamentals on the proper methods of fitting noncorrective eyewear. According to information received by this writer, three facial characteristics are usually considered when selecting the correct eye size goggle for an individual: (1) the distance between the pupils (pupillary distance, abbreviated PD) which affects the eye size; (2) the shape and size of the nose, which determines the bridge size; and (3) the position of the ears, which determines the temple length. Glasses are fitted so that the wearer's pupils look through the center of the lenses. The pupillary distance is approximately equal to the eye size plus the bridge size, where eye size is the width of a lens and bridge size is the distance between the lenses (abbreviated DBL). Incidentally, the eye sizes were found to be confusing. Round lenses are sold according to their true diameters, like 45.8 millimeters (abbreviated mm.) and 50mm. Whereas lenses, commonly known as P-3 lenses, are sold in 42, 44, and 47mm. sizes even though these figures

do not represent the exact diameters of these lenses. For example, a lens sold as 44mm. eye size actually has a horizontal diameter of 45mm. and a vertical diameter of 42mm. The difference between these two diameters is three millimeters, hence the designation, P-3. Bridge sizes are furnished in 18, 20, 22, 24, or 26mm. DBL, or as 19, 21, 23, or 25mm. DBL, depending upon the manufacturer, or whether the goggles come in a series of acetate frames or metal frames. Since bridge size, eye size, and pupillary distance are measured in millimeters, it may be well to remember that the millimeter, as a unit of length, is about the thickness of a dime and that 1 inch = 25.4mm. Temple length of goggles is measured from the rim of the lens to the opposite tip of the temple and can be expressed in inches. Temple lengths are often sized in quarter inch intervals, chiefly from six to seven inches for metal temples and from five to seven inches for acetate temples.

Because the West Allis School of Vocational and Adult Education had received a generous supply of metal, spectacle type safety glasses from a local industrial firm (A) to help implement its eye safety program, this writer asked a safety eyewear representative to furnish information on the probable size distribution of glasses. This request was made so that supplementary purchases of new glasses would be restricted to sizes in which shortages would be most likely to develop. The eyewear representative provided some size distribution tables which were compiled from purchase orders received from industrial firms. These tables are reproduced as Tables I and II.

TABLE I. Approximate Distribution of One Hundred Pair Metal, Spectacle Type, Safety Glasses Based on Orders From Industry

Eye Size mm.	*Bridge Size — mm.* 19	21	23	25	*Total pair*
44	5	25	25	10	65
47	5	5	15	10	35
Total	10	30	40	20	100

Table II. Approximate Distribution of One Hundred Pair Metal, Cable Temples Based on Orders From Industry

Length in inches	6	6¼	6½	6¾	7	7¼
Number of pair	5	15	60	10	8	2

NOTE: Just prior to the publication of this article, another safety eyewear representative was contacted to obtain data on spectacle sizes currently ordered in this area. He furnished these figures as an average distribution of 100 pair metal frame goggles:

50 pair of 44 eye size, split between 21 and 23mm. bridge size,

45 pair of 47 eye size, split between 23 and 25mm. bridge size, and

5 pair of glasses distributed between 42 eye size with 19 or 21mm. bridges and 50 eye size with 23 or 25mm. bridges, depending upon the manner in which companies desired to speculate.

As to acetate frame glasses, this latter representative indicated that the 44 eye size wih 22 bridge and 6½-inch temple length was in greatest demand. It may be well to also point out at this time that in Wisconsin, the Industrial Commission allows the use of 44 and 47mm. eye sizes, but does not favor the use of 42mm. lenses.

2. *Manufacturers' Catalogs and Practice:* The visit to the manufacturer of safety eyewear was terminated with a practice session on the servicing and adjustment of safety spectacles. Skills and knowledge attained by the writer at that time were further developed through the study of manufacturers' publications. For example, it was learned that some catalogs contain charts which list the occupations, processes, or materials in various industries, together with the equipment recommended for eye protection in those industries. The magazine, *National Safety News,* furnishes good leads on manufacturers of eyewear and equipment they produce. The pamphlet, *Right on the Nose* (B), provides valuable information on the fitting and maintenance of noncorrective industrial safety goggles. Additional practice in the latter operation, maintenance of goggles, was obtained by the writer by servicing the equipment which our school initially received from the local industrial firm previously mentioned. Some of the glasses were in need of repairs or adjustments. In some instances, it was necessary to "cannibalize" the equipment. That is, it was necessary to salvage serviceable parts from several pieces of damaged equipment, and then to reassemble those selected parts to form reconditioned, usable glasses. Incidentally, a good supply of spare parts was obtained in this manner.

3. *Visit to an Industrial Eye Safety Department:* The used glasses acquired by the school presented a problem. How were they to be cleaned and sterilized? A satisfactory answer was found in industry. During a visit to the Health and Safety Department of a neighboring plant (A), the Supervisor of Industrial Hygiene demonstrated the company's sanitizing procedure. Protective eye equipment was: (1) disassembled and inspected for worn and damaged parts; (2) scrubbed in a warm detergent solution, such as Fab, or Dreft; (3) rinsed with running water; and (4) immersed in a disinfecting bath prepared by the dilution of Roccal Sanitizing Agent (K) with water. The equipment was then: (5) air dried in a large oven with controlled air flow and automatic temperature regulators. Finally, (6) the equipment was reassembled and packaged in either cellophane bags or cardboard cartons. This process of cleaning and sanitizing safety eyewear appealed to us, because dirt, oil, and grease were effectively removed from equipment prior to sterilization. There wasn't any fuss with irritating fumes or the rubber gloves, special goggles, or respiratory equipment necessary in other methods of sterilization.

Initial Operation of the School Program

The training of this writer, and housekeeping duties, such as inventorying, servicing, sanitizing, and storing of equipment took a few weeks. However, by the end of September, the school's eye protection program was put into operation. The objectives of the program and general procedures of operation were outlined in Mr. Van Duzee's article.[3] However, as the school year went by, a continuous appraisal of the program indicated that some revisions in the techniques of operations were necessary. The procedure, wherein shop instructors in 100 per cent eye protection areas were issued packets of safety eyewear for the purpose of fitting and supplying their students, proved unsatisfactory. Students complained of poor fits, and instructors were reluctant to use class time to fit new students. Sometimes, a shortage of a special size goggle developed in one shop while an excess supply of that same size goggle was on hand in another shop. Such conditions prompted reconsideration of certain operating procedures.

An Ideal Program vs. Reality

School personnel believe it would be fine for all concerned with the eye protection program if students fitted with safety glasses would realize the need for them, take care of them, and clean them, and if they would personally accept the responsibility to bring the assigned glasses to the shops and wear them. The situation would be even better if students purchased their own safety eyewear. However, such an ideal plan encountered realities when a revision of procedures was considered early in the 1953–54 school year. The collection of deposit fees for glasses wasn't an easy task, so compulsory student purchase of glasses was out of the picture, especially when the high student turnover rate was considered. An assignment of equipment to students with expectations that they would carry assigned eyewear to shop classes was considered, but rejected on the assumption that failure, on the part of students, to bring equipment to class would increase disciplinary problems, disturb normal shop operations, and make enforcement a major problem. In addition, past experience indicated that release of equipment from shops resulted in an increased rate of loss and damage to equipment. With due consideration of these factors and the ten-

[3] *Ibid.*, p. 204.

ets of an ideal program, a revised program was placed into operation early in 1954. The remainder of this article describes the techniques of administering the current student eye protection program.

Fitting and Size Distribution of Glasses

Day school students who enroll in shop courses are required to make deposits on safety eyewear in the school's general office at the time of enrollment. Students, such as apprentices who possess approved safety goggles, are exempt from making deposits only as long as they utilize their personal equipment. The deposit fee is one dollar. Refunds are made to students upon withdrawal from school, providing assigned equipment is in satisfactory condition. (A higher deposit fee, sufficient to cover the cost of a pair of goggles, is being considered for next year.) New students are notified to visit the person in charge of the eye protection program during regularly scheduled office hours. Shop teachers are provided with two or three extra plastic shields to accommodate those students who have initial shop sessions before they can visit the eye protection office.

As the person in charge of the eye safety program, this writer is relieved from a teaching assignment for one and a half hours daily to administer and develop the program. Students are fitted during the first portion of the period, and housekeeping chores are done during the latter part. A small room in which eye protection equipment is stored is used as an office. From experience, it is known that students are reluctant to wear dirty equipment. Therefore, care is taken to keep the storage and office space, and all equipment clean and orderly. Teachers have been briefed to send new students to the eye office during the regularly scheduled time. It is felt that the fitting appointment is a critical stage in the development of a proper attitude toward eye protection. If a student is sold on the need, the problem of enforcement is diminished. Therefore, an attempt is made to give each student personal attention during his office visit.

Students are naturally inquisitive about the metal frame, spectacle type glasses in our fitting set. They ask about the crosses that are etched on the lenses and about the numbers that are also there to identify bridge and eye sizes. They are encouraged to make visual comparisons between the 44 and 47 eye sizes. An attempt is made to make them feel that they are fitted with comfortable goggles that give optimum protection. Occasionally, a co-worker, M. J. Shogren, chides the fellows, "Don't worry if Mr. Drew can't fit you. When you come to my class, we'll put your head in the vise and squeeze it to fit the glasses. Of course, it's hard on the vise, but we aim to please everybody." Seriously though, a satisfactory fit is obtained by sampling pairs of spectacles from the fitting set. The required temple length is obtained by observing whether the known temple length on the sample glasses is short, long, or just right.

All spectacle type glasses in stock are filed according to bridge size, eye size, and temple length. Since similar measurements are obtained from glasses in the fitting set, the selection of correctly sized, sanitized glasses for a given student is a simple operation. Frequently, in order to complete a fit, it is necessary to adjust nose pads with optical pliers, and to form temples to fit the wearer.

When a fitting is completed, the glasses are placed in a clasp envelope, and the following data are entered on the envelope with indelible pencil: (1) name: *last, first;* (2) bridge, eye, and temple size, as 23–44–6½; (3) receipt number for deposit on glasses; and (4) room number and name of instructor. Each student is informed that his safety glasses will be delivered to his shop and that the instructor in charge will issue the glasses to him at the beginning of his next class period. (Many of our students are assigned to two shops. In such cases, two pairs of glasses are fitted, one for each shop.) Every pair of glasses that is fitted and assigned to a student is delivered to the student's instructor and added to the instructor's account.

Only noncorrective industrial safety glasses are fitted at the school. Students who wear personal glasses are furnished plastic eye shields. However, if a student desires to obtain a pair of safety goggles ground to his prescription, he may purchase them through the school upon presentation of a prescription from a member of the ophthalmic professions. Naturally, upon receipt of his corrective glasses, a student must return to his examiner for necessary adjustments to the glasses. As stated in Mr. Van Duzee's article, staff members who require corrective eyewear, are furnished such eyewear gratis.[4]

In the early phases of our program, an inadequate size distribution of glasses prevailed. At times, it was difficult to properly fit students. Tables I and II, which were improvised by a representative of a safety eyewear firm, came in handy when additional equipment was purchased. Lately, however, this writer has been compiling the distribution table shown in Table III, that are based upon actual demands in the school. Now, these tables are referred to when additional equipment is needed.

[4] *Ibid.*, p. 204.

TABLE III. Approximate Size Distribution of One Hundred Pair Metal, Spectacle Type, Safety Glasses for White Boys 16–18 Years of Age*

Bridge Size DBL (mm.)	*Eye Size*	*Temple Length in Inches* 6	6¼	6½	6¾	7	*Total Number of Glasses*
19	44			8			8
19	47				1		1
21	44		1	24	7	1	33
21	47			1	1		2
23	44	1	1	26	7	7	42
23	47			1	6	1	8
25	44			3		1	4
25	47			2			2
Totals		1	2	65	22	10	100

*Based on the actual distribution of 160 pair of glasses to students at the West Allis Vocational School.

Control of Glasses

Shop instructors are held accountable for eye protection equipment delivered to their shops. A mimeographed form, which contains a list of equipment and supplies, is used to keep a perpetual inventory for each teacher simply by canceling out one figure and writing in a new figure behind the item involved in a supply transaction. The original copy of the form is retained in the eye protection office. A duplicate copy is issued to an instructor for his personal files.

At present, instructors determine their own procedures for passing out assigned safety eyewear to the students in their classes. Our machine-shop instructor, Robert Lynch, uses a method that is effective. He stores shop glasses in eyeglass files in his desk drawer. When a student comes to class, Mr. Lynch removes the student's glasses from the clasp envelope in the file, and hands the glasses to the student while that boy is briefed on a job assignment for the day. At the end of the shop period, the glasses must be returned to Mr. Lynch before attendance credit for the session is granted. The loss and damage of glasses in this shop has been negligible.

When a student is withdrawn from a shop, the instructor in charge marks his clasp envelope, "Withdrawn on (*date*)," and returns the safety glasses to the eye protection office. In the case of a transfer from one shop to another, the instructor who is losing the student, marks the clasp envelope, "Transferred to (*shop*) on (*date*)," and sends the safety glasses to the eye protection office. Necessary changes are made in the instructor's accounts, and the glasses are forwarded to the instructor who is to receive the transfer student.

Upon withdrawal from school, a student is given a clearance form which must be stamped by all of his instructors. Checking of eye equipment is part

Fig. 1. Safety eye-wear sanitizing station in the machine shop

— Photograph by Victor Schmitt

of the clearance routine for shop teachers. If a student's assigned equipment is damaged beyond ordinary wear and tear due to gross abuse or negligence on his part, the amount of the damage is entered on the clearance form. Instructors are provided a parts price list for this purpose. If a student's clearance form is incomplete or contains entries for damaged equipment, personnel in the school's general office withhold the student's deposit. Final disposition of the case is made by a member of the administrative staff.

In June, as school closes, instructors return safety eyewear to the eye protection office. There is an exception or two. Welding shields and helmets are kept in the welding shop and appear on the equipment inventory for that shop. This is also the case for special goggles in the foundry. In other words, eye equipment which is limited to usage in a specific shop appears on the equipment inventory for that shop alone and remains in that shop.

Cleaning and Sanitizing

You may recall that only sanitized equipment is assigned to a student at the time of his fitting. Thereafter, it is the responsibility of the student to keep his eyewear clean. This procedure was set up primarily to counteract the, "They're too dirty," reply in answer to the question, "How come you're not wearing your safety glasses?" By providing an additional means for more active student participation in the eye protection program, the problem of enforcement diminished noticeably.

Sanitizing stations are set up in the shops. Figure 1 shows the sanitizing arrangement in our machine shop. The left hand container holds a detergent and a brush, and the right hand container holds the sanitizing agent. An identical set of instructions is posted over each container. The four by six-inch cards read as follows:

TO SANITIZE EYE EQUIPMENT

Directions

Step

1. Scrub eye equipment with cleansing agent in container marked, No. 1 — Cleaner.
2. Rinse eye equipment in clear water.
3. Place eye equipment in container marked No. 3 — Germicide. Keep equipment in germicide for at least two and one half (2½) minutes.
4. If time allows, dry eye equipment in the air. Otherwise wipe off with lens tissue which can be obtained from the instructor.

Steps 1 and 2 are circled on the left hand card, and steps 3 and 4 are circled on the card at the right. Attention getting eye charts (C and J) are posted between the two containers. The charts are changed periodically simply by sliding them in and out of a cellulose acetate faced envelope. The four by six cards are also covered with cellulose acetate to prevent soiling.

The development of the sanitizing stations is a story in itself. As previously mentioned, the use of Roccal as a sanitizing agent appealed to us. We sought more information and learned that it is almost completely free of irritative or "allergizing" effects, even if it comes in contact with the eye. In normally recommended dilutions for industrial goggles (one ounce of 10 per cent Roccal to one gallon of water), this germicide is practically odorless, colorless, nontoxic, and no more corrosive to metals or alloys than water. In response to a request for more information on the use of Roccal to sterilize eye protective equipment worn alternately by a number of workers, a spokesman for the supplier (K) suggested the immersion of glasses in a concentration of 2000 p.p.m. (2½ ounces of 10 per cent Roccal per gallon of water) for two minutes to insure the elimination of molds and fungi (ringworm). However, a longer period of immersion, preferably a minimum of 15 minutes, was suggested as more desirable. It is unnecessary to rinse goggles in water. A power bacteriostatic effect can be maintained on the surface of goggles if this germicide is allowed to dry on them. If eyewear is well cleaned with a compatible, cationic detergent prior to immersion in the germicide, the germicide should remain clear and maintain its full bactericidal potency for at least a month.

The development of suitable containers for holding the sanitizing solutions in the school shop stations was certainly a co-operative project. This writer made his needs known to the sheet-metal instructor, M. J. Shogren. Together, we designed several containers, and the students in Mr. Shogren's classes worked on some of the more promising projects. Some metal containers were rejected because of corrosion. Glass was rejected because of the additional safety hazards involved. Plastic containers were favored, but at that time, a suitable type couldn't be found. Rubber containers were high priced. Finally, Henry Tillich, our instructor of electricity, hit upon the idea of utilizing discarded auto battery cells. Mr. Schmitt, our co-ordinator, came to our help. He contacted a local manufacturer (D) and obtained a shipment of battery case rejects. A band saw with an old blade in it was put into action in the woodshop, and soon, sufficient battery cells were salvaged for trial runs in the eye protection program. Mr. Shogren designed a holder for the cells, and his students worked on the project, while Mr. Schmitt, also an art teacher, lettered the containers. Figure 4, metal holder — for sanitizing container, by Mr. Shogren, shows the holder currently in use in our shops. Containers are merely snapped in and out of the holders as solutions need to be replaced. It is not necessary to dip goggles into the cleaning solution. A brush, when lifted out of the solution, holds enough cleaner to satisfactorily clean a pair of goggles (hairbrush — courtesy homemaking department). However, goggles are immersed in the germicide, and are recovered by one of several methods currently being tested — a hooked plastic rod; a basketlike sieve; or a stirrup

suspended through a small hole near the leading edge of the metal cover.

At first, some of the people who wore bifocals were hesitant about immersing them in the solution. Don't worry. Bifocals are usually fused on and not cemented on as many wearers believe. Acetate glasses can also be washed.

The sanitizing stations have been accepted by the teachers and the students, and they are being utilized for the job for which they were designed. One of our early fears that "students will hang around the stations to kill time" did not materialize.

Inventory of Equipment

Several educators inquired about the type of equipment used in a student eye protection program. The type of equipment used depends upon the objectives of the program, the eye hazards involved, financing, and other factors. Much of our equipment was donated by industry or made in the school shops. Uses for most of our equipment and supplies are listed after the items which appear below. Approximate current prices are given for the convenience of those who are interested in financing similar programs. Letters in parentheses refer to manufacturers listed at the end of this article.

Storage of Equipment

In the eye protection office, equipment and supplies are stored in the steel cabinet pictured in Figure 2. Equipment that is returned from the shops is placed on the bottom shelf. At an opportune time, this equipment is serviced, sanitized, packaged in clasp envelopes or cellophane envelopes, and then placed on the upper shelves. This cabinet is 36 in. wide, 24 in. deep, and 78 in. high. There are seven storage levels, six shelves plus the base of the cabinet. This cabinet holds about 100 pairs plastic shields, 800 pairs spectacle type glasses, a gross of boxes of tissue, and the spare parts and equipment required for servicing. The cabinet is arranged as follows: (1) The top shelf is used for the storage of plastic shields and plastic spectacle type glasses which are serviceable and have been sanitized. (2–3) The second and third shelves hold spectacle type glasses, metal and acetate frames respectively. The glasses are packaged in envelopes or in manufacturers' cartons and are ready for issuance to students. As mentioned previously, each package is labeled with the bridge size, eye size, and temple length, as 23-44-6½. The packaged glasses are filed in metal trays which can hold about 30 cartons or about 50 clasp envelopes each. The trays are marked only with the bridge and eye

Item	*Use*
Equipment:	
Safety glasses, metal spectacle type, without side shields, 6.00D clear, curved lenses — assorted makes.	For general use where frontal eye protection is required — because temples may be changed as needed, our glasses are inventoried only by bridge and eye size — about $2.75 pair (B and C).
Safety glasses, metal spectacle type, with nose and side shields, 6.00D clear, curved lenses — assorted makes — acetate and mesh shields.	For impact protection from every angle — for grinding, polishing, chipping, pouring aluminum — about $3.15 pair (B and C).
Safety glasses, acetate frame, 6.00D clear, curved lenses — assorted makes — can be furnished with side shields and adjustable nose pads.	Protection against frontal impact — for use where spark hazards are present, as in the electrical shop — this type is preferred for "looks," but frame and temple breakage may be high — about $2.75 pair (B and C).
Cup-type glasses.	Protection against dust, fumes, acid, or large and heavy flying particles — from $1.90 to $3.90 pair.
All-plastic clear eye shield with elastic headband.	Used as a coverall for students who wear prescription glasses — $1.50 pair (B).
SAF-I-SPEC, large, 241003, all clear, all plastic, spectacle type eye shield — skull type temples; SAF-I-SPEC, small, 241001.	Easily fit over personal prescription glasses — being tested for visitors' use — $1.65 each (G).
Tuc-Away Spectacle, plastic retrax temple, clear regular side shield, Model 415-CSS; Tuc-Away Spectacle, full 1 in. side shield, Model 415-CSSF; Tuc-Away Spectacle, semicup, Model 415-CSC.	Furnish side and bottom protection — feature adjustable temple lengths — being tested for visitors' use — visitors to our shops must contact Mr. Jess LeMahieu, the assistant director. He reported that these glasses have been received favorably by visitors. $2.25 pair (H).
Fitting set for industrial glasses, metal frame, M-50 type.	$21 (C).
All-Steel Cabinet, green, with six shelves, 36" wide, 24" deep, 78" high.	Storage of eye protection equipment and supplies — about $65.
Pliers, optical, needle type.	For frame adjustments, especially nose pads — about $4 pair.
Screw driver, optical, combination (or reversible blade).	For temple screws and end piece screws — 55 cents each.
Tweezers.	
Scissors.	
Cabinet, steel, four drawer, with adjustable compartments, 8½ x 10 x 8 in. high.	Storage of screws, lenses, nose pads, pliers, screw driver, etc.
Tray, metal, filing, for safety glasses.	For filing safety glasses in storage cabinet — made by Mr. Shogren — see Drawing No. 2.
Holder, metal, wall type, for sanitizing container.	To support sanitizing container — see Drawing No. 1.
Container, rubber (auto battery cells).	To hold sanitizing solutions (cleaner and germicide).
Supplies:	
Brush, hand.	To scrub safety eyewear with cleaner.
Frames, metal — assorted sizes.	Spare parts — we use no more than two for each 100 pair of glasses issued — about $1.35 each.
Frames, acetate — assorted sizes.	Spare parts — $1.35 each.
Lenses, clear, 6.00D curve lenses for M-50 type of glasses.	To replace broken lenses, or scratched lenses, or lenses splattered with metal — about $1.25 pair.
Nose pads.	We use no more than one pair for each 100 pair of glasses issued — 18 cents pair.
Temples, regular fold.	Spare parts for metal frame goggles — 35 cents pair.
Temples, front fold.	For metal frame goggles with side shields — 35 cents pair.
Temples, acetate, skull.	Spare parts for acetate frame glasses — 55 cents pair.
Temples, acetate, cable.	For acetate frame glasses — 55 cents pair.
Temple tubing, brown.	To cover cable temples — 12 cents per foot. Brown doesn't show repulsive discolorations as readily as the white tubing.
Screws, temple, for metal frame.	3 cents pair.
Screws, end piece, for metal frame.	These screws which hold the lenses in the frames are different from the temple screws — 3 cents pair.
Headband, elastic.	For cup goggles — 17 cents each.
Detergent, cationic.	Cleansing agent in "cleaner" solutions posted at sanitizing stations.
Germicide, Roccal Sanitizing Agent, 10 per cent solution.	For sanitizing safety eyewear — about $9 gallon (K) — same as Zephiran Chloride.
Plastic Cleaner, Willson.	Being tested for cleaning and preserving plastic lenses, and for clearing minor scratches — $1.50 pint (J or E).
Lens tissue, box of.	For wiping safety glasses — $15.40 gross (B).

Item	*Use*
Envelopes, Franklin Clasp, No. 5 size, 3⅛ by 5½ in.	For storing sanitized glasses — holder for glasses assigned to students — $1.50 per 100.
Cellophane bags, 4¼ by 6¾ in. — 300 MST.	For storing and protecting sanitized, plastic spectacles — the mouth of the envelope can be stapled or heat sealed with an ordinary iron — $6.35 per M.
Cellophane bags, 4 by 2¼ by 10½ in. — 450 MST.	For storing and protecting sanitized, plastic shields and cup goggles — $13.48 per M (F).
Fog-Ban.	Being tested as an antifogging agent for use under welding helmets $1.50 for 3 oz. jar (C).
Eye safety charts.	Posters for sanitizing stations — from manufacturers of safety eyewear (C and J).
Cellulose Acetate, 20 in. by 25 ft. No. 88 Acetate.	Used to cover and protect eye safety charts, and cards with directions for sanitizing eyewear — about 95 cents roll (Office Supply Firm).
Labelon Plastic Tape, 400 in. length, green and white ¾ in. width.	For labels — $1.85 roll.
Form, mimeographed, "Directions for Sanitizing Eye Equipment," 4 by 6 in.	Posted at each sanitizing station.
Signs, "This is a 100 per cent Eye Protection Area. Wear your safety glasses."	These signs were designed by Jerry Vojta, our drafting instructor. At present, all of our shops are designated 100 per cent eye protection areas. However, the problem of overprotection has arisen occasionally, and is being studied in some shops.
Catalogs and price lists.	References on eye protection equipment (manufacturers of safety eyewear).

EYE PROTECTION PROGRAM
You are reading this with your last pair of eyes
Your school wants you to keep them for life
Your School has set up
Your School has fitted you with safety glasses
Your School has set up sanitizing facilities for these glasses
DO YOUR PART - wear your safety glasses - Keep them clean
Keep your eyes. You need them.
EYE AREA
12
Glass Eyes
WHY?
WEAR
1
CLEANER
3

Fig. 3. Occasional exhibit in a corridor display case

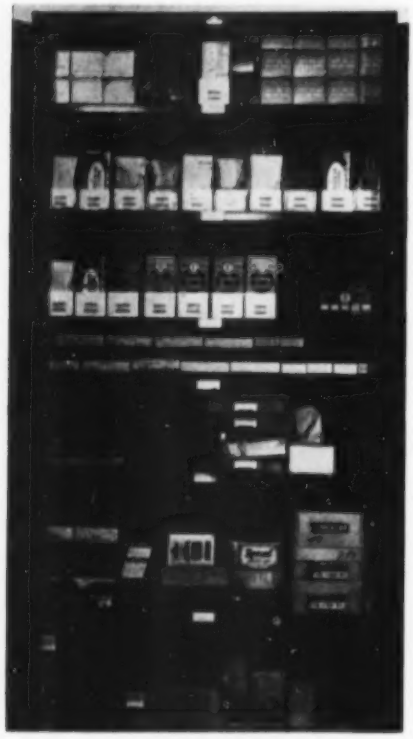


Fig. 2. Storage cabinet for eye protection equipment

size, as 23-44, and the glasses are filed therein according to temple length, the shortest temples being up front. In a partially filled tray, the packaged glasses are kept upright by a rubber band wrapped around the tray. A spring clip may be used if desired. Although a green and white plastic tape, Labelon, was used to identify these trays, gummed labels, masking tape, or paint can be used just as well. These trays were also made in the school's sheet-metal shop. Refer to Mr. Shogren's Figure 5, Filing Tray, Safety Glasses. (4) The fourth shelf holds spare parts (frames, temples, lenses, and temple tubing) for servicing equipment. Cardboard boxes in which prescription glasses are shipped, or cartons which hold movie camera projection lamps, are used to make files for the spare parts. The cover portion of a box is removed from the inner or smaller portion of the box. Either two cover portions or two inner portions are held together, side by side, with masking tape to make a double file. The files are labeled by printing the contents of the files directly on the masking tape — for example:

Frames		or	*Temples*	
			Left	Right
19-44	19-47		6 in.	6 in.

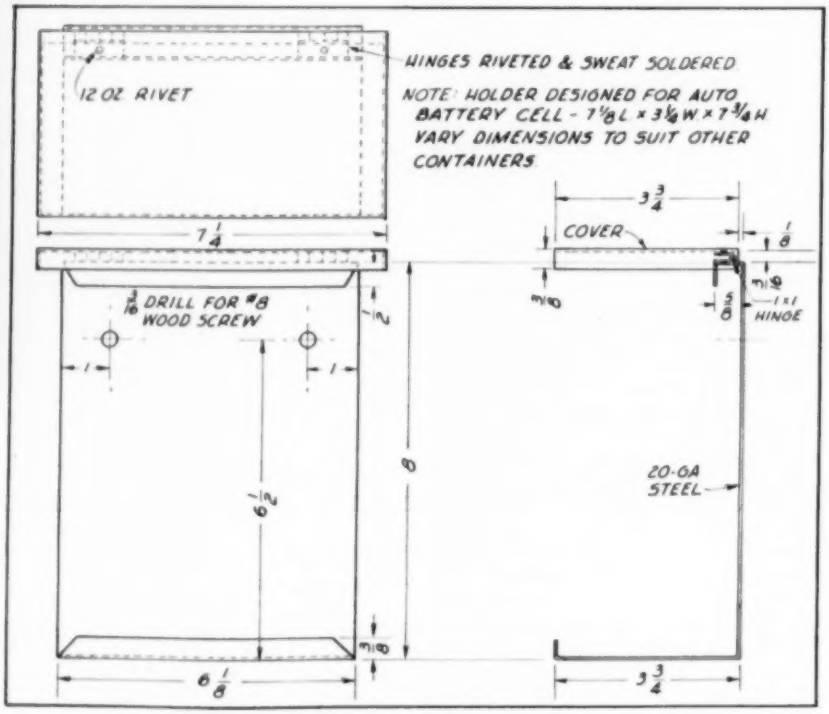


Fig. 4. Holder for sanitizing container

In the latter example, a matched pair of replacement temples can be located readily. (5) The fifth shelf holds the servicing equipment (pliers and screw driver), small supplies (screws, nose pads), the fitting set, office records, an open box of lens wiping tissues, and a supply of silicone treated tissues. (6) The sixth shelf holds mostly expendable supplies — tissues, tape, clasp envelopes, cellophane bags, germicide, detergent, and eyecharts. (7) The bottom shelf is for storage of dirty and broken equipment, extra eyeglass files, and items of similar nature.

Enforcement

The preceding sections outlined procedures for fitting, issuing, controlling, sanitizing, servicing, and storing eye protection equipment. These procedures were set up to encourage acceptance of, and adherence to, the program, so that among other reasons, the problem of enforcement would be a minor one. On occasion, when flagrant violations do occur, necessary disciplinary actions, or administrative measures, are handled in a line organization manner — student, shop teacher, assistant director, and director. In matters of enforcement, the person in charge of the eye protection program takes a position similar to that of a staff member in the line and staff type of organization encountered in modern business — advice and aid is given to the line organization, but no authority for enforcement is assumed by the staff member.

Enforcement is left up to the line, but the staff member attempts to exert an educational influence on the line. Safety posters at the sanitizing stations, occasional corridor displays, such as shown in Figure 3, attempts to familiarize instructors and students with new equipment, appraisal of *gripes* to recognize and eliminate their causes, and off-the-record chats are all examples of such educational influence. As pointed out previously, resentment to wearing safety eyewear can be reduced considerably if eye equipment fits well, and if it is kept clean and orderly. If the program is well organized so that personnel realize it's there to stay, if personnel really understand why and under what conditions eye protection equipment is worn, if they have an active part in formulating the program or participating in the program, they usually adhere to and even promote adherence to the rules. It appears that the key man in a school eye protection program is the shop instructor. If he favors the program and has confidence in safety eyewear made available to him, he practices eye safety, and his students accept his leadership. It ought to be easy for him to see the need of eye protection.

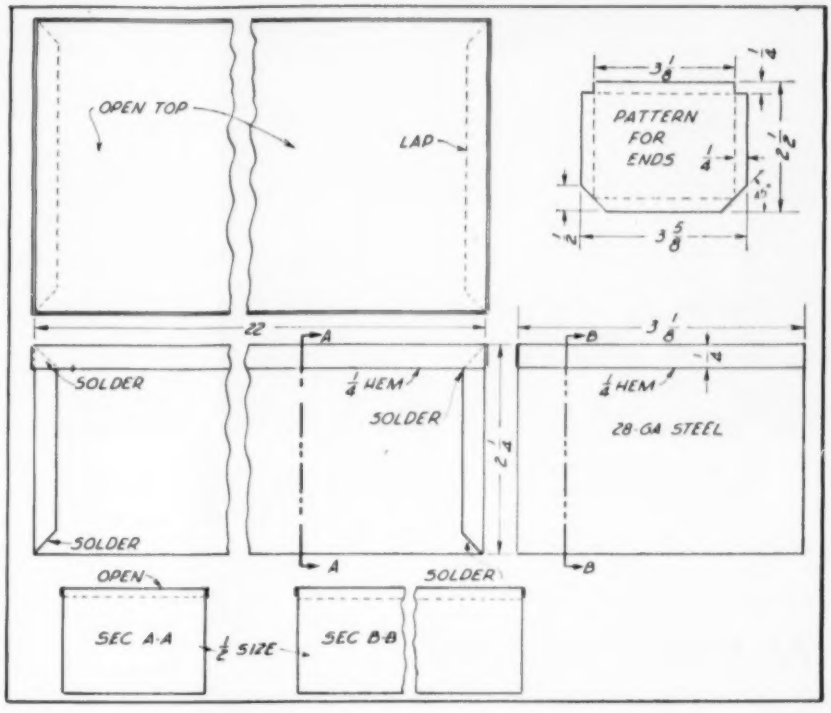


Fig. 5. Filing tray for safety glasses

Can We Afford to Be Without a Student Eye Protection Program?

The success of our student eye protection program is due to a number of factors, the primary ones being: the foresight of the West Allis Board of Vocational and Adult Education in adopting and promulgating eye protection policies similar to those in progressive industrial firms in the area (I); the combined, persistent efforts of Mr. Van Duzee, Mr. Schmitt, and Mr. Le Mahieu to organize and develop the program; the efforts of shop instructors to help their students form good eye safety habits; the advice furnished by manufacturers of safety eyewear; the aid of friendly industrial neighbors; and finally, and very important, the support of our laymen. It is felt that the time, money, and effort still being expended to insure the success of our safety program is certainly worth while, especially when these factors are compared with the economic loss and other very serious problems encountered by a person experiencing the sudden loss or impairment of his eyesight.

As a result of our safety program, we have with us today, a boy who can still see. Yes, he was wearing safety spectacles when surplus molten metal which he was pouring into a pig mold, contacted a droplet of moisture, exploded, and splattered his goggles with molten aluminum.

By saving the eyesight of our students, we are certainly strengthening school-community relations. Parents of our students appreciate the school's regard for the safety of their youth, and local industrial firms gratefully endorse the practice of developing good eye safety habits in the future workers of the community.

No, we can't afford to be without an effective student eye protection program. The risk involved is too great.

Sources of Information and Equipment

A. Allis Chalmers Mfg. Co., Health and Safety Dept., Industrial Relations Division, West Allis, Wis.
B. American Optical Co., Safety Products Division, Southbridge, Mass.
C. Bausch and Lomb Optical Co., 210 W. Michigan St., Milwaukee, Wis.
D. Globe Union, Inc., Milwaukee, Wis.
E. Protective Equipment, Inc., 634 Orleans St., Chicago 10, Ill.
F. Strauss Paper and Products Co., Inc., 108 N. Broadway, Milwaukee 2, Wis.
G. United States Safety Service Co., 1215 McGee St., Kansas City, Mo.
H. Watchemoket Optical Co., Inc., 232 W. Exchange St., Providence 3, R. I.
I. West Allis Industrial Safety Council, School of Vocational and Adult Education, West Allis, Wis.
J. Willson Products, Inc., Reading, Pa.
K. Winthrop-Stearns, Inc., 1450 Broadway, New York 18, N. Y.

An adequate eye examination for glasses cannot be made in less than 45 minutes, according to the American Optometric Association.

At left — This combination lobby and foyer permits prompt service to library patrons yet allows supervision of the other library facilities. **At right** — The workroom where new books are catalogued and old volumes repaired

An Efficient Addition

The New Library at The Stout Institute

THOMAS F. FLEMING
English Department
The Stout Institute
Menomonie, Wis.

The new $600,000 library building which was occupied early in March, 1954, and dedicated on Commencement day, June 4, has been placed in use by The Stout Institute, Wisconsin State College of industrial education and home economics at Menomonie, Wis. Students and faculty recently joined in a gigantic "moving day," during which over 35,000 volumes were transferred from the cramped quarters of Stout's old library facilities into the new library building.

Built with an eye to Stout's steady expansion, the library provides stack space for 107,000 volumes. Two tiers of shelving will handle 40,000 books each, with space for 27,000 additional volumes in separate textbook facilities. Second floor stacks are unusual in their installation, being hung from hooks attached to a metal ceiling.

Within the stacks are "carrells," or small study alcoves. These are designed to provide optimum research conditions for the work of advanced and graduate students, as well as the college faculty.

Especially striking in the interior of the library is the 128 by 47 ft. reading room, capable of seating 250 students comfortably. Tables for both group and individual study have been provided. In a special division of the main reading room are display facilities for 175 current issues of periodicals. Past magazine issues for a current year are accessible on shelves on the main floor. On the mezzanine are kept magazines of earlier years.

A Memorial browsing room on the first floor will give students easy access to memorial book collections and book gifts presented to the college by former Stout teachers and administrators or by friends of The Stout Institute.

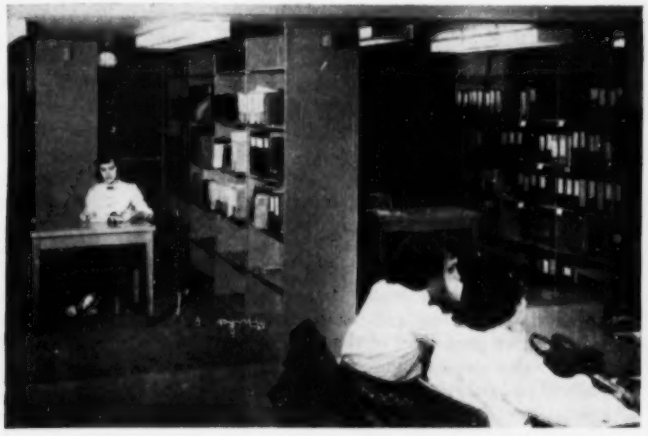
Informality is the tone of the Memorial browsing room. In its 24 by 36-ft. area, comfortable chairs, lamps, and rugs have been combined for a warm, restful atmosphere. Here students and faculty members may pick and choose from among the brightly bound volumes of professional reading or fiction which line the walls.

Receiving much notice in the new library structure is the "last word" in lighting equipment and techniques. The reading room has the advantage of floor-to-ceiling windows which use daylight to maximum efficiency. In addition, over 8000 electrical fixtures have been strategically installed throughout the building.

Ten miles of small lighting and control wire carry necessary current, in addition to 4000 feet of heavy feeder wire. New-type, slimline fluorescent fixtures provide 60 candle-power illumination per square foot in the main reading room. Set flush with the ceiling, the fluorescent fixtures eliminate all shadows and provide soft, easy-on-the-eyes illumination.

Indirect lighting techniques have been employed in a number of places in the library. In addition, over 300 globe-type bulbs diffuse light with maximum effect amid the backstacks. An emergency lighting system provides ample light for safe exit should the main electrical network fail. Six electrical distribution panels are required to control the complex illumination system.

The flooring is largely rubber tile, of



At left — This 128 by 47-ft. reading room in the new Stout library can seat 250 students comfortably. **At right** — A total of 24 individual study nooks on the two levels of the new Stout library permits study and research

which 5400 one-foot squares were used in the main reading room alone. The foyer is attractively tiled in a light blue-green mosaic pattern, designed to withstand the heavy traffic of patrons entering and leaving.

The basement contains audio-visual rooms, a recording and micra film library, filing stack space, and a faculty lounge. A theater-style audio-visual viewing room will seat 95 persons.

The latest in equipment is available throughout the audio-visual center, part of Stout's greatly-expanded audio-visual aids service. The microfilm laboratory permits research work and other files to be filmed and stored with maximum efficiency. Projectors have been installed for the previewing and projection of audio-visual films and film strips.

Seminar rooms are provided for detailed or special study by small classes or committees. These "general purpose" rooms encourage group activity and individual research.

A typing room, equipped with typewriters, is available to students and faculty. The proximity of this room to total facilities of the library is designed to stimulate research and the writing of required professional papers and articles.

Administering the construction of Stout Institute's new library were Dr. Verne C. Fryklund, president of the college; Robert L. Pierce, president of Stout's Board of Trustees; and Miss Lillian Froggatt, who is chief of the library staff.

The new library is only one of a number of buildings in prospect for The Stout Institute. This spring, construction began on a $700,000 dormitory for 134 coeds. In the future are an additional shop building, a field house, and a student union.

Whose Is The Responsibility?

Administrator Relations

KERMIT A. SEEFELD
Chairman
Department of Industrial Arts
Santa Barbara, Calif.

Have you ever said, or heard your colleague make the statement, "Our administrators do not know what is going on in industrial-arts education"? The counselors know much less or they wouldn't be giving us all the dumbbells, and from all I can determine by speaking with parents, they know very little about industrial-arts education and care less.

Should you be in a system where this thinking is existent, has it ever occurred to you that it might be the fault of the industrial education teacher? Do you have a public relations program, or better, by new terminology, a proper relations program? What is done by you or for you as a group of educators in the name of proper relations in an attempt to sell industrial education? Immediately you think of institutes, college courses by extension or evening classes, summer school institutes, and professional meetings. As we enumerate these titles, we find that the education is pitched primarily for the in-service preparation of the industrial-arts teacher who already is an expert in his field and does not necessarily need the type of information available via these routes.

Is it not your responsibility to enlighten the responsible personnel and the public as to the virtues and emoluments of industrial education? On the assumption that it is your responsibility, the profession should share with one another ideas, stratagems, and methods which would enable us to dis-

patch the responsibility. A case in point is a report of a method used by a school system in Southern California to accomplish better understanding of the objectives and scope of an industrial-education program. The objective of the method about to be presented is primarily in-service education — not only for the superintendent of schools, the principals, the supervisors, the counselors and the parents, but also for the instructors in the program.

The get-together was programed as an all-day meeting and all of the administrative personnel of the school system — the superintendent, three secondary school principals, six or eight counselors, industrial education supervisors, and the heads of departments of the secondary schools in the systems were invited. The State Chief of the Bureau of Industrial Education was also invited as were representatives from teacher education institutions in the State. This group met at ten o'clock in the morning in the cafeteria of one of the schools, enjoyed a cup of coffee and then proceeded to visit each of the three secondary schools in the district. People were invited to ask questions, to offer comments, to speak with students or the instructors. The entire group then assembled at the home-economics department and were served a very fine luncheon by a home-economics teacher and one of her classes. After the luncheon, the group assembled in the conference room where four experts were introduced. Each spoke on an assigned topic and discussion followed. A superintendent spoke of the status of industrial education in his system. A state officer spoke of trends in industrial education. An instructor of industrial education attempted to clarify thinking in the realm of definitions and concepts and one of the principals spoke on the subject of how to finance the industrial arts and the vocational education program. One could conceivably think of many other and more important areas for presentation and discussion dependent upon the problems particular to a school system. At 3:30 this meeting adjourned and all of the industrial-arts teachers of the system joined the group for coffee and doughnuts and good fellowship for a half hour. An effort was made to introduce each to the other so that everyone knew all at the meeting. The industrial-education supervisor called on four individuals, the state director, a teacher educator, a visiting supervisor, and a parent, for their comments and criticisms of the school's industrial-education program as they noted them during the morning visit. The group was then broken into eight buzz sections who considered eight problems which had grown out of the day's efforts. One of the problems was: "How can this school district secure better teachers for our industrial-education program?" There were others of a general nature and some very specific to the problem as it pertained to the district such as: "Should there be a vocational education program in all three schools or should it be concentrated in one?" These small groups worked under the chairmanship of a person selected for his or her ability in group leadership. A recorder was selected who reported the findings to the entire group. All the reports were given by industrial-education teachers and were limited to five minutes. At the termination of the reports, all of which were extremely interesting and valuable, the chairman thanked all participants and expressed appreciation particularly to the superintendent for permitting the industrial-education people to sponsor the program. He then called on the superintendent who expressed great appreciation to the industrial-education people for taking the initiative in this most worth-while adventure and he complimented his personnel for their accomplishments to date and their foresightedness and pursuance for even greater things in the future.

A Public Relations Effort

Colored Slides Sell Shop Programs

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Many ambitious projects have meager beginnings. When money was made available in the school budget, some of us in Schenectady who work with industrial arts and vocational students decided to invest in photographic supplies. Our first thoughts were to photograph the better projects in our shops so we would have a running record of student accomplishments. We also wished to have some photographs of shop displays, tool panels, and work areas. While this would have been an important addition to our program it seemed even more important to use this equipment so that it would be of more direct benefit to the community and justify the investment of the taxpayers' money.

The Need for This Type of Publicity

There are many people in our community who have a genuine interest in shop programs. Each visitor looks at the shop with respect to his own interest as a parent, taxpayer, businessman, or educator. Unfortunately, too few of these people have the free time during the day to observe our industrial arts and vocational programs in action. By offering illustrated talks using colored slides of students in actual learning situations, many people can be reached, new understandings developed, and new friends made for the shop courses. This was our most important reason for investing in photographic supplies.

Our next step was to decide what type of equipment to purchase. What kind of camera should we buy? Who was to use it? Should we take black and white or colored slides? Should it be a camera that takes eight, twenty, or thirty-six exposures per roll? After much deliberation and research by many on the staff, it was decided to purchase a

low-cost miniature camera with an f/4.5 lens, shutter speeds to 1/200 of a second, taking eight exposures to a roll of film. Every man in the industrial arts and vocational education department was to have a chance to use it, therefore the shorter rolls would be more practical. The camera could be used with black and white or colored film.

What accessories would be needed? A light meter was ruled out since it was not necessary for indoor pictures. For indoor type colored film, no filters were necessary. A tripod was purchased with enough tube extensions to photograph machine operations. A photoflood bulb with holding bracket was needed since some of the shops had inadequate lighting for indoor photography. A flash holder completed the outfit. Now we were ready for business.

The First Pictures Shown Junior High Students

The first pictures that were taken with this outfit met the main objective for which the camera was purchased. The author had the responsibility of increasing enrollment in trade shop programs. Each spring, to help the ninth graders elect a high school curriculum, a program is presented in each of the junior high schools describing the advantages of the trade courses. Lectures without illustrations were found to be inadequate. The author was also responsible for presenting a program in the senior high school describing the co-operative courses. Here again lectures without illustrations were unsatisfactory. Furthermore, there was a reorganization in the city school system to consolidate a vocational high school with a general high school so that costs of vocational education would decrease and educational opportunities for all prospective students in the city would increase. This made it necessary to inform students, teachers, and the public of the educational opportunities available under this new arrangement. Our meager project was reaching major proportions.

The first colored slides were taken of boys working in the vocational shops. Since our main objective was to show operations rather than faces, the vocational teachers were asked to list those operations which they considered to be typical of the program. Needless to say, high school students were eager to be photographed at their work. After a few unfortunate experiences with teachers who wanted to photograph groups of their best students, a general rule was enforced that no more than two students would be represented in one picture. Where possible, one operation and one student were shown.

When the first stage of the project was completed, it was decided to photograph the work of the industrial-arts shops since so many of the questions put to the author by students, parents, and teachers concerned the differences between vocational education and industrial arts. To cover the school shop programs completely, the evening vocational shops were also photographed. The same rules of procedure were followed in taking these pictures.

As a roll of film was completed, it was mailed to the processing laboratory for developing. The price of developing the film and making the slides is included in the original purchase price. The results were gratifying even though this was a first attempt at photography. Good color arrangements and proper placement of the students were found to be very important. Each picture had to describe the operation being performed. Therefore it was necessary to make the operation the focal point of the picture. Using colored film added beauty and interest to the pictures.

Photographing the Co-operative Programs

Photographing the co-operative programs was a photographer's dream. Here was an opportunity to take pictures of students at work under the most diversified conditions with colorful backgrounds. There were boys working in printing plants, machine shops, bakeries, garages, greenhouses, automobile body shops, electrical appliance repair shops, and others. There were girls working in stores and offices; selling merchandise, answering calls on switchboards, operating calculating machines, arranging floral decorations, and waiting on customers. The students who were photographed felt complimented; their employers were most co-operative.

Before long, one hundred slides were available. The price of the film plus the flash bulbs amounted to about $40. Now we were ready to justify the investment by offering the illustrated lectures to interested groups.

The first showings of the films were before those students who worked in the shops, stores, or factories where the pictures were taken. The slides were shown in a darkened classroom using a screen and projector supplied by the audio-visual aids department. As a student's picture was shown on the screen, he was asked to describe the job he was doing. Comments were added by the author. The second showing was before shop teachers who co-operated in this venture. They were asked to comment on the operation that the student was doing. The author was absorbing this information to be used at future showings before community groups.

The vocational advisory board of the city of Schenectady was making a study of all school programs. Within an hour, these slides proved to be an excellent means of introducing the members to the many training agencies in the school curriculum. The members of the senior high school faculty were shown these slides during an orientation meeting to acquaint them with the trade, co-operative, and industrial-arts programs. The superintendent of schools has requested a showing before a staff meeting of administrative personnel.

A news release was given to the local newspapers. The community reacted quickly to this offer of slide lectures on vocational and industrial-arts programs. The service clubs in the community requested showings of the slides at their meetings. Parent-teacher groups in the junior high schools asked for the illustrated talks. Junior high school guidance counselors scheduled the talk at occupational meetings with ninth-grade students discussing vocational opportunities available in the senior high school. By showing junior high school students the vocational and industrial arts programs operating in the senior high schools, it is hoped that they will be better able to select and attain their occupational goals. In this way it is believed that the enrollment of genuinely interested students in our shop courses will be increased.

Looking to the Future

As it is discovered which fields of vocational and industrial-arts education students and other interested groups are most concerned with, it will be necessary to add more slides to the present collection. Groups who request these illustrated lectures have varied interests and it is important to adjust the lectures and choose the slides accordingly. In all cases the main objective will be to develop an understanding of what we are trying to do for the vocational and industrial-arts students and to sell our shop courses to the community.

Costs of drilling for oil increase fantastically as drilling depths increase. A 13,000 foot well, instead of costing two and a half times as much as a 4000 foot well, costs six times as much to drill! Despite the staggering costs involved, oil men continue to drill deeper and deeper in their search for oil. One well recently was drilled to a depth of more than 21,400 feet. — *Petroleum Newsnotes.*

Conceivably, every organic chemical known to man can come from the hydro-carbon molecule of petroleum. Moreover, many of these products can be produced at lower cost from oil than from any other source. — *Petroleum Newsnotes.*

Industrial Arts and Vocational Education

JOHN J. METZ, Editor

DO SOMETHING ABOUT IT

Conditions will not improve until the individual does something to make them improve. School shops are naturally more noisy than are the drafting rooms or the academic rooms. But necessary shop noises are not what is to be discussed here, but rather the noises produced by willful students who want to draw attention to themselves, or show their disrespect to their instructor.

If the mischievous actions of one student are condoned, other students may and usually do follow the wrongdoer's example. Unless drastic steps are then taken, chaos will result.

The question is how can a group of young students be influenced to act in a becoming manner and get out of the habit of doing unnecessary talking and making disturbing noise.

One teacher of seventh-grade boys assures me that he has no trouble with impressing upon his boys that they should talk to each other only when necessary and then only in whispers.

Those boys who forget themselves are assigned to copy the following paragraph three times.

"In our school shop we are allowed to talk in whispers only. This is necessary in order that best work be done with safety to pupils and equipment. I have heard this rule many times. Because I talked aloud, I must copy this three times.

"I promise that in future I will talk only in a whisper."

This teacher seems to have very good results with this system. Of course, he uses good judgment. He has laid down these rules for himself:

Don't reprove the wrongdoer before others — take him aside and speak quietly to him.

Don't antagonize your students.

Don't expect absolute compliance. If possible give the boy the benefit of a doubt.

If a rule has been laid down, see that it is obeyed, and follow up; do not let an infraction pass without correction.

AN EXAMPLE THAT SCHOOLS MIGHT FOLLOW

A Lexington, Ky., department store has started a worthwhile movement. In a department separate from the store itself, it offers only "do-it-yourself" items and with this service the store also offers the customer the use of hand and power tools.

The pyramiding "do-it-yourself" market is quickly growing and home handymen who want to make home improvements and repair work are found there two evenings each week busily engaged on their individual undertakings. The shop is kept open until 9:00 p.m., two evenings each week. One 70-year-old Lexington woman who is a regular attendant, says, "It is no more difficult to operate a lathe or bandsaw than a sewing machine."

This do-it-yourself shop also offers to gather the lumber, hardware, and finishing materials for customers who want to build something. It also is ready to lend or rent hand or power tools with which the customer can do the work at home.

The store reports that most of the people who come to make use of their facilities are quite careful with the tools, and in the five months of the shop's operation there have been no serious damages to any of the equipment.

Metal, especially the handy do-it-yourself aluminum, is used frequently in combination with wood in the pieces that are made at this shop.

What a fine example is set by this forward-looking business firm to our schools. Schools are equipped to offer the same kind of services to their neighborhoods, and the feeling of the community to the school might become much more friendly if such services were offered.

MONEY BADLY NEEDED

Congress approves a five-million-dollar increase in federal funds for the 1955 fiscal budget for vocational education. There is no question that our government is justified in looking for ways and means to trim the budget to the amount of money on hand for paying the bills. But the idea is incongruous to cut down the amount needed for training the skilled and semiskilled help so badly needed if we are to keep America from sinking to the low living standards that are prevalent in some of the European countries.

We have lived through two world wars, a Korean debacle, and the still existing cold war which required and continues to require high expenditures for experimentation and production of war material. During this time we have learned the need for having on hand a vast reservoir of skilled workers who could keep our production of war materials at a high level, or whose labor could be converted to the production of household articles which had to be pushed aside more or less during the troublesome years. Yet we have seemingly not learned how necessary it is to keep this reservoir of skilled workers filled to its maximum capacity.

During the war years we learned what vocational education was capable of. Thank God we had its valuable assistance. But now it seems there are people in high places who think there is no more need to give aid to vocational education, or shall we say to American vocational education, for it seems that there is still money to be had for aid to foreign educational ventures. We seem to have forgotten that most of our practical education was borrowed from Europe. Possibly if we let those people use their own methods of educating their workers they may again do the superb job they used to do years ago, and without any financial aid from us.

In the meantime let us be thankful for the additional five million dollars that have been granted. The fund of $26,672,261 for 1955 is still far from the $29,300,000 which it ought to be, but it is a great help.

VACATIONS ARE OVER

The school year 1954–55 is about to begin and shop teachers must be ready to assume their duties in a short while. The experienced teacher knows the need of preparedness before he meets his first class.

So much depends upon first impressions. It is, therefore, of utmost importance that the student get the right impression of his teacher as well as of the industrial-arts shop in which he is about to begin his industrial arts or vocational education work.

There is still time to make necessary preparations. And — don't forget to inform our circulation department of any change of address you have made or will make.

Historical Notes and Personages

Leaders in Industrial Education

WILLIAM T. BAWDEN
Emeritus Professor of Industrial Education
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HOMER JOHN SMITH

The subject of this sketch is properly described as the foremost leader in his chosen field since the death of Robert W. Selvidge, in 1941, and that of Charles A. Bennett, in 1942. He has written extensively, and has been active in many professional organizations. He has visited schools, studied programs and experiments, and addressed gatherings of teachers and administrators in nearly every one of the 48 states, as well as in selected centers in Europe. Very few leaders in industrial education enjoy as wide personal acquaintance as he. Men of the younger generation, and especially students in our teachers colleges and universities, should be encouraged to familiarize themselves with his writings and his teachings.

It seems impossible to determine the place and the date of our first meeting, but I believe it to have been at the tenth meeting of the Manual Arts Conference of the Mississippi Valley, which was held in Cincinnati, in December, 1919. At any rate, this was his first meeting of the Conference, of which he has been an active and constructive member for nearly 35 years.

Early Life

Homer John Smith was born at Livingston, Wis., December 3, 1885, and is a graduate of the high school at Rewey, Wis. During the two years, 1906–1908, he was a student at the State Normal School, Platteville, where he completed the two-year normal course. He is a graduate of the University of Wisconsin, Madison, degree Ph.B., 1915. In 1922, he completed the requirements for the M.A. degree at the University of Minnesota, and for the Ph.D. degree in 1926. His doctor's dissertation was the report of an intensive study in the field of administration of industrial education.

His first teaching position was in an ungraded rural school in South Wayne, Wis., 1905–1906. And now, in conformity with the retirement provisions of the Minnesota State Board of Regents, he achieves the status of professor emeritus at the close of the academic year, 1953–54, after 48 years from the date of his first teaching.

His second teaching position was in the senior high school at Platteville, Wis., where he taught mathematics and industrial arts, 1909–10; after which he served three years, 1910–13, as principal of an eight-room elementary school in Waukesha, in the same state. Following graduation from the University of Wisconsin, he was appointed vice-principal of

Homer J. Smith

the Boys' Technical High and Trade School, Milwaukee, where he remained six years, 1913–19. During this six-year period he was employed also as instructor of evening classes for the preparation of industrial teachers in the Milwaukee Center of the Extension Division of the University of Wisconsin.

He received his initial appointment as a member of the faculty of the College of Education, University of Minnesota, in the fall of 1919. In 1924, he became head of the department of industrial education, was promoted to the rank of professor in 1930 and retired from these positions in

June, 1954, after 35 years of continuous service. He has developed at the University of Minnesota one of the outstanding departments for the preparation of leaders in industrial arts and in federally aided vocational education, especially in the Graduate School, and a center for study and research in these fields.

Varied Activities

Dr. Smith has taken a prominent part as a leader in many significant movements, only a few of which can be discussed here because of the limitations of space. For a number of years he has been an influential member of the Minnesota Advisory Committee for Private Trade Schools. During World War II and the years following he was consultant to the Minnesota State Advisory Committee for Defense Training; also consultant to the Committee on Evaluation of Experiences in the Armed Services, for the American Council on Education. For many years he has been a member of the Educational Policies Commission of the Minnesota Education Association.

Still another important service was his membership for seven years on the Board of Directors of the Minneapolis Urban League. He also served on the Minnesota State Committee on Curricula in Industrial Education, and the State Committee on Guidance and Counseling.

Industrial Arts Conference

Since 1919, he has been an active member of the Manual Arts Conference of the Mississippi Valley, an organization of heads of departments of teacher-training institutions, which recently changed its name to Industrial Arts Conference. During the period when I was chairman of the Conference, I had occasion frequently to consult him on problems connected with the planning, organization, and conduct of the programs, and found his advice and suggestions invaluable.

In connection with committee assignments in the Conference he completed a number of studies that were highly esteemed by the members. For one example, he submitted an epoch-making report on "Objective Tests and Measurement as Applied to Manual Arts and Industrial Subjects," at the 14th meeting of the Conference, which was held at the University of Illinois, Urbana, November 15, 16, 17, 1923. With his report he distributed copies of a 12-page mimeographed "Bibliography" of tests and measurement, with particular reference to the needs and interests of students of industrial education. The references were classified, as follows: (1) general and basic, (2) special, (3) general ability or capacity, (4) special abilities and achievement, (5) uses of tests in guidance, (6) uses of tests in vocational schools, (7) uses of tests in industry.

In revised and somewhat extended form, this report and the accompanying bibliography were published in one of the professional journals, and thus made available to a wider audience.[1]

At another session of the same meeting of the Conference, Dr. Smith reported on plans under way at the University of Minnesota for "the development of industrial-arts teachers in service." Three principal features of these plans were discussed, as follows:

1. The University makes certain concessions in the remission of fees to teachers who enroll for courses while actively teaching.

2. In exchange for the privilege of conducting practice teaching and educational research in the public schools, the University distributes to the superintendents of city schools in Minneapolis and St. Paul a number of "fee slips" each year. These slips are awarded by the superintendents to teachers in the schools. Each slip is good for five credit hours of work in the College of Education, free of all expenses.

3. The University is conducting a considerable amount of extension and correspondence work.

In 1948, Dr. Smith was appointed by the War Department as consultant on vocational education for the U. S. Zone of Occupation in Germany. For several years he has served as secretary of the Coffman Foundation for Scholarship and Research in Education.

Mention should be made also of his services as chairman of the Interim Legislative Committee on Vocational and Higher Education of Minnesota. He has served as consultant to the Minnesota State Civil Service Commission. He is a participant in the National Conference on Life Adjustment Education, conducted under the auspices of the United States Office of Education. He is a member of the Editorial Advisory Committee of the American Technical Society.

He has served on important committees named by the U. S. Office of Education for the preparation of bulletins in the field of industrial education. He was a member of the Vocational Education Committee of the Minnesota Resources Commission; member of the Minnesota Advisory Committee for Vocational Education; member of the President's and the Governor's Committees on Industrial Safety.

Professional Organizations

He has long been an active member of the National Education Association, serving as president of the Vocational Division one term; the Minnesota Education Association, president of the Industrial Education and Home Economics Section, 1920, and president of the Industrial Education Division, 1927; the Minnesota Vocational Association, president one term, 1929; National Vocational Guidance Association; Minnesota Vocational Guidance Association, president one term; American Association for Adult Education; Horace Mann League, member of the board of directors one term; National Association of Industrial Teacher Educators, secretary-treasurer one term; Vocational Education Association of the Middle West, member of the board of directors, 1926; American Association of University Professors; American Technical Education Association.

American Vocational Association

Special mention should be made of Dr. Smith's connection with the American Vocational Association, of which he became a member in 1919, and later life member. In 1939, he was elected vice-president for a term of three years, to represent the Industrial Arts Section, following the late Robert

[1] Homer J. Smith, "Objective Measurement in Industrial Education," *Industrial Education Magazine*, Vol. 31, Mar., 1930, pp. 331-336.

W. Selvidge in this important post. He was also a member and chairman for two years of the Committee on Standards of Attainment in Industrial Arts, and chairman of the Editorial Sub-Committee in charge of the revision of the bulletin. *Improving Instruction in Industrial Arts*, published in 1946. One of his significant assignments in the American Vocational Association was as chairman of the Research and Publications Committee, in pursuance of which he was responsible for encouraging and directing a series of valuable studies.

For several years past he has been a member of the Plans and Policies Committee, and has served also on other important committees. Through these committee assignments he has made a major contribution to the progress of industrial education, and especially to better understanding of the vital relationships of general education and industrial arts and vocational industrial education.

At the annual convention of the American Vocational Association, in 1945, he was awarded the citation by The Ship, "for distinguished leadership in industrial education." At the 47th annual convention, held in Chicago, November 22–27, 1953, Dr. Smith was presented with the "Outstanding Service Award," by the Association, as follows:

Outstanding Service Award

Dr. Homer John Smith, outstanding teacher, capable administrator, author, lecturer, and consultant in industrial education. A citizen of broad racial sympathies, active in protecting the rights of minority groups and of the underprivileged. Known for his interest in and for promoting patriotic and humanitarian issues in his city and state. Recognized leader in his profession, unselfish in his duty and devotion to educational progress: an inspiration to his students, and a friend of man. In recognition of his service to the profession, the American Vocational Association is honored to present this Outstanding Service Award to Dr. Homer John Smith.

(To be continued)

Device For Improving Classroom Instruction

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How can we improve the effectiveness of our instruction in the classroom and in the laboratory? This, of course, is a question which will challenge any instructor who is interested in doing a better job. Like a tree with many branches, the question has many ramifications. Therefore, for purposes of this article, it seems desirable to take a look at one of the main branches, the thing that we do every day in the classroom.

Day after day, as we work with boys and girls, youth and adults, we demonstrate manipulative operations and present related information topics having technical, general, and guidance values. We refer to these operations and related information topics as lessons. What kind of lessons do we present? Do we ever stop to take a look at ourselves, the way we carry on in the classroom? Do we have a yardstick for gauging the effectiveness of our daily presentations? Implied in these questions are worth-while goals which can be effectively achieved through the use of a *Lesson Evaluation Check List*. Let us take a look at the instrument.

The lesson evaluation check list, which follows, is a device for securing improved instruction in both the classroom and the laboratory. It is a device which permits instructors to look at themselves and is useful to supervisors and teacher trainers as a supervisory instrument. Therefore, the instrument may be used by instructors for self-appraisal purposes; by in-service groups as a critique method; and by supervisory personnel for on-the-job lesson evaluations.

In one form or another the lesson evaluation check list has been used for several years in a teacher education program designed to prepare instructors for the field of industrial arts. Supervising teachers, teacher trainers, and prospective instructors have used the instrument in teacher training programs and have found it helpful in gauging progress and in analyzing performance. The check list, it seems, serves a very useful purpose and meets an instructional need.

There are two main divisions to the check list. Part *A* which constitutes one of the main divisions presents in statement form the implications of the four industrial education lesson steps of "Preparation, Presentation, Application, and Testing." The second main division, part *B*, consists of statements which are more general in scope and which apply to any phase of the lesson. Both groups of statements require appraisals. These are made by checking the category which best describes the presence or absence of the condition implied in the statement. Check marks in either one of the first two columns indicate instructional weaknesses and serve to point up areas or conditions needing improvement. A check mark in the third column denotes satisfactory fulfillment of the provision or condition.

In using the check list as a self-evaluation instrument, it is recommended that each statement be prefaced by the phrase, "Did I." When used in observing and evaluating the work of others, it is suggested that each statement be prefaced by the phrase, "Did the instructor." Thus, the first statement under *Preparation* becomes "Did I or did the instructor have all teaching materials and aids ready for the lesson?" Using one or the other of the two introductory phrases makes the statement more specific.

The complete format for the lesson evaluation check list follows:

LESSON EVALUATION CHECK LIST

Procedure: Insert title of lesson in the space provided and in the appropriate column opposite each statement, place a check mark to indicate your best judgment of the condition. Statements which appear to be irrelevant to the lesson topic are to be left blank.

Title of Lesson: _____

Part A

I. *Preparation or Motivation Stage:* Did I (or the instructor):	*No*	*Partly*	*Yes*
1. Have all teaching materials and aids ready for the lesson?			
2. Make proper arrangements for ventilating and lighting the room?			
3. Arrange the pupils so that all could see the demonstration or hear the lesson?			
4. Review the previous lesson?			
5. Make an effort to ascertain what the pupils already knew about the topic under consideration?			
6. Utilize past experiences of learners to introduce the lesson?			
7. Ask questions which tended to arouse and direct the thinking of the learners?			
8. Create in the mind of the learners a state of readiness for the topic to be discussed?			
9. Make the correct transition from the preparation stage to the presentation stage of the lesson?			
10. Make clear to the class the main objective of the lesson?			
II. *Presentation Stage:* Did I (or the instructor):			
11. Explain new terms or words?			
12. Accomplish the main function of the presentation stage which is to add new ideas to those already in the minds of the learners?			
13. Adhere to the content that stemmed from the objectives set forth for the lesson?			
14. Present the ideas in the most effective order?			
15. Make certain that each point was understood before proceeding to the next point?			
16. Perform the demonstration or make the explanation at the correct pace for understanding?			
17. Appear to have a mastery of the procedures to be followed?			
18. Make adequate provision for asking questions?			
19. Emphasize the more important ideas of the lesson?			
20. Perform the demonstration in a creditable manner?			
21. Present a lesson which contained the recommended number of new ideas?			
22. Employ praise during the lesson?			
23. Stress safety?			
24. Have a thorough acquaintance with the subject under discussion?			
25. Employ or use several methods to put over the subject matter of the lesson?			
26. Utilize the drawing out process rather than the "pouring in" process?			
27. Summarize the main points of the lesson?			
28. Make the learners aware of the standards to be achieved?			
III. *Application Stage:* Did I (or the instructor):	*No*	*Partly*	*Yes*
29. Make provision for the learners to perform the operation or carry out an assignment directly related to the material presented?			
30. Put the pupils to work on what was given in the presentation stage of the lesson?			
31. Check the learners to see whether they could do the work?			
32. Make a noticeable effort to correct the weak points in the pupil's knowledge or in the skills being performed?			
33. Employ the application phase of the lesson as a checking and re-instruction period?			
IV. *Testing Stage:* Did I (or the instructor):	*No*	*Partly*	*Yes*
34. Check learner's work against criteria previously determined?			
35. Have the learners perform the operation or apply the knowledge unaided and undirected?			
36. Have appropriate criteria for evaluating the learner's work?			
37. Check to see whether the objectives had been achieved?			

Part B

I. *General Considerations:* Did I (or the instructor):	*No*	*Partly*	*Yes*
1. Employ good judgment in handling all phases of the lesson?			
2. Maintain good posture?			
3. Talk loud enough?			
4. Use a vocabulary appropriate to the class?			
5. Manifest drive and enthusiasm?			
6. Refrain from talking to the walls and chalk board?			
7. Avoid displaying peculiar mannerisms which could be controlled?			
8. Stay within the time allotted for the lesson?			
9. Seem to be free from nervousness and fidgitiness?			
10. Enunciate words properly?			
11. Secure active student participation during the lesson?			
12. Avoid errors when asking questions?			
13. Employ correct grammar?			
14. Handle well the questions asked by the pupils?			
15. Ask pertinent and thought provoking questions?			
16. Make general use of the chalk board to put over material?			
17. Establish and maintain rapport?			
18. Maintain the interest of the class during the discussion phases of the lesson?			

Problems and Projects

TWO METALWORKING PROJECTS

DICK HUTCHINSON
San Gabriel, Calif.

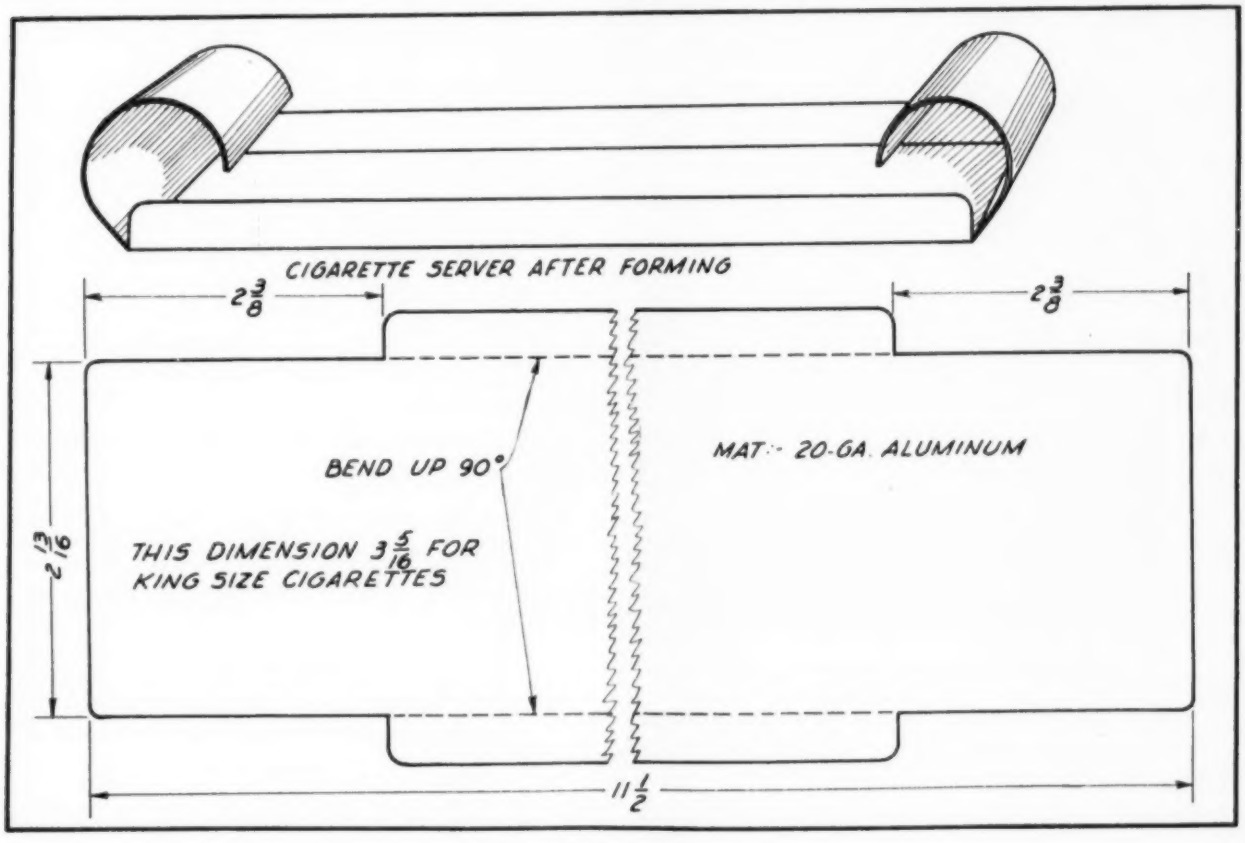
With the great strides being made in designing new laborsaving equipment for craft work, it is now possible for the training schools, as well as many metal craftsmen, to own and operate machines that will do the work in much less time, and much more accurately.

We are illustrating here two metalworking projects, either, or both of which may easily be done by hand if machines are not available. However, we are showing some of the operations being done on the smaller 12-in. type fully equipped metalworkers bench and, along with these, we are showing one or two operations that will simplify some of the operations if the work is to be done by hand.

Fig. 1. Bending light metal by hand

First, we will make the cigarette server, an ideal piece for the reception room. The server is made from 20-gauge soft sheet aluminum. Copper also may be used if desired. The whole project can be completed in a very short time.

Lay out the outline on the metal, and cut



Details of the cigarette server

out on the shears, or with the tin shears, and round the corners, as indicated. File the edges smooth.

Place the piece in the brake and bend the two wings up as shown. This will result in a smooth even bend. If a brake is not available, place the piece between two hardwood blocks and clamp in the vise, and bend, as shown in Figure 1. Where hammered pieces are being bent, the metal may be hammered down evenly. If aluminum, or other smooth surface material is used, place a strip of wood over the metal and strike with the hammer, thus preventing marring the surface of the material.

Now roll the ends in the 12-in. slip roller — around as far as the sides of the server will permit. Then brake — by hand — sharply, as shown, and roll the two ends in slightly, as in the drawing.

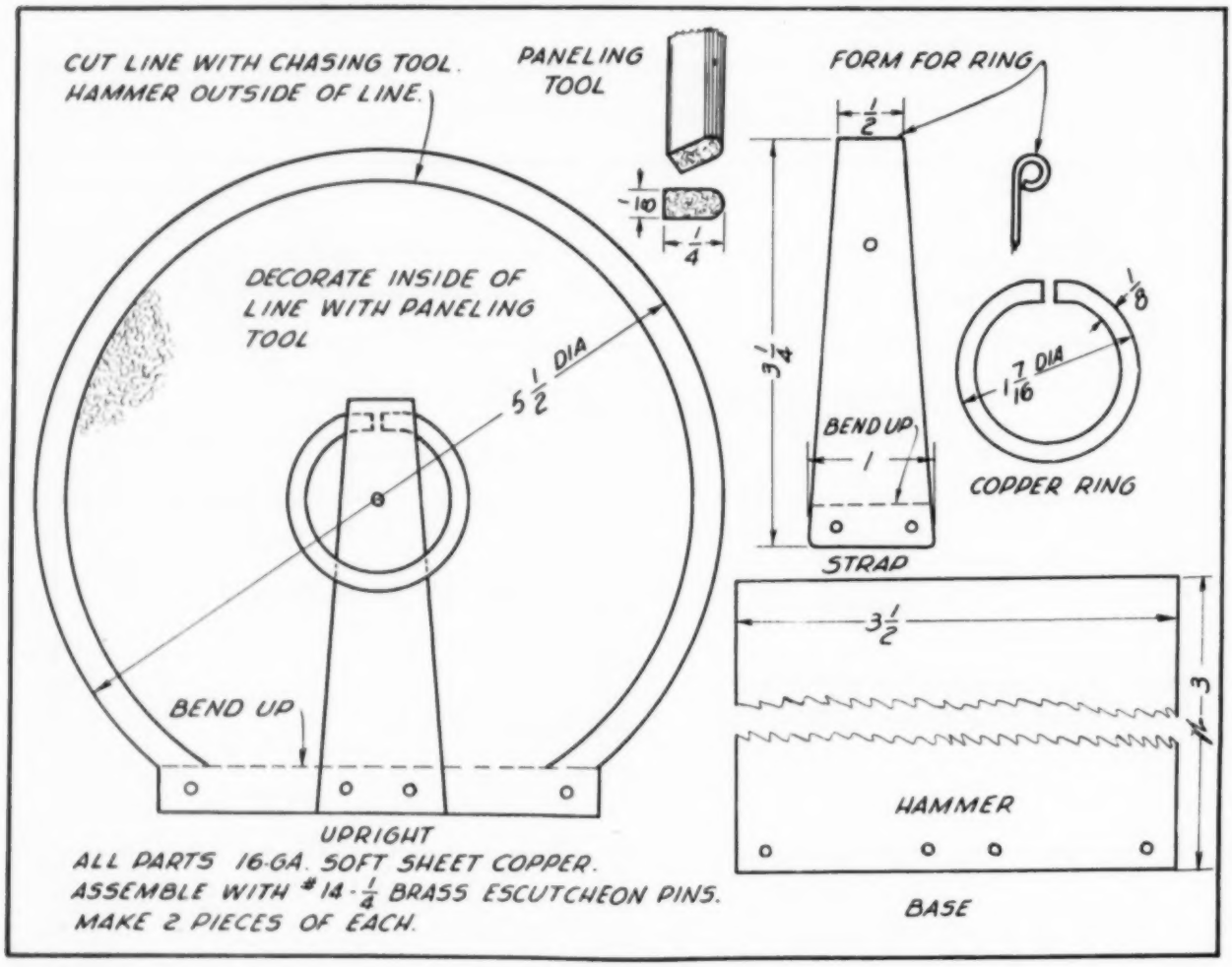
To form the ends by hand, roll them around a 1-in. diameter steel bar. The finished server is shown in Figure 2.

To remove slight scratches and restore that silvery finish to aluminum, dip a soft cloth in fine (15 M) carborundum powder, and go over the surface of the metal with this, applying and rubbing gently with a rotary motion.

Fig. 2. Cigarette server

Fig. 7. Hand hammered copper book ends

The beautiful set of book ends shown in Figure 7 may be made by hand, or the cutting and bending may be done with the machines. In cutting copper or other



Details of the book ends

Fig. 3. Clamp one handle of the tin shears in the vise. The cutting can then be done easily and accurately

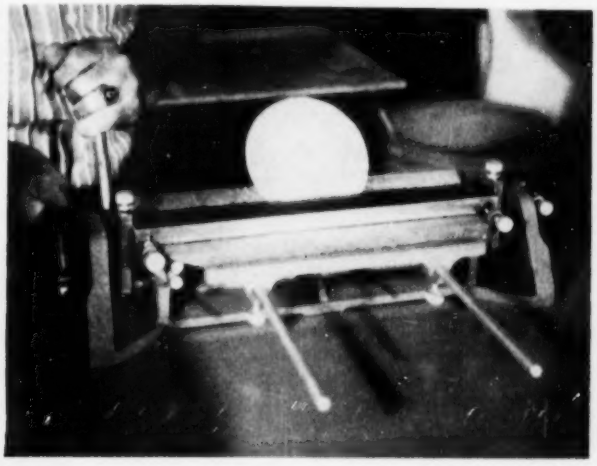


Fig. 6. Bending the bottoms of the book end uprights

metals, it will be found that if one handle of the tin shears is clamped in the vise, as in Figure 3, that greater leverage may be obtained, and a line can be followed more closely.

Lay out, and cut the blanks on the shear, as shown in Figures 4 and 5. Scribe the border line on the uprights, and chase in with a chasing tool, or with a blunt cold chisel. Hammer outside the line then, using the paneling tool, tool over completely inside the line. Drill the holes, as indicated, then bend up ⅜ in. of the bottom, in the brake, as shown in Figure 6. Cut out the blanks for the bases, and hammer on one side.

Cut the two straps, and hammer. The two rings are made from ⅛-in. copper wire. Roll around a bar of steel, or a length of pipe, and flatten the top side, as shown in the drawing. Drill holes in the straps to correspond with those in the uprights, then bend the bottom up in the brake, and roll the top around the flat side of the rings.

Drill holes in the bases to correspond with those in the uprights, and assemble the book ends complete with ¼-in. No. 14 brass escutcheon pins. See Figure 7.

A beautiful finish for this type piece is obtained by going over thoroughly with fine steel wool, or the pieces may be highly polished on a buffing wheel. In either case, apply a coat of transparent lacquer.

A piece of felt may be glued to the bottom to prevent scratching of furniture. However, glue does not hold to metal very successfully. It is better to coat the bottom of each book end generously with a good enamel, then press down into a layer of felt flocking. Remove and let dry, and dust off. This will not come off.

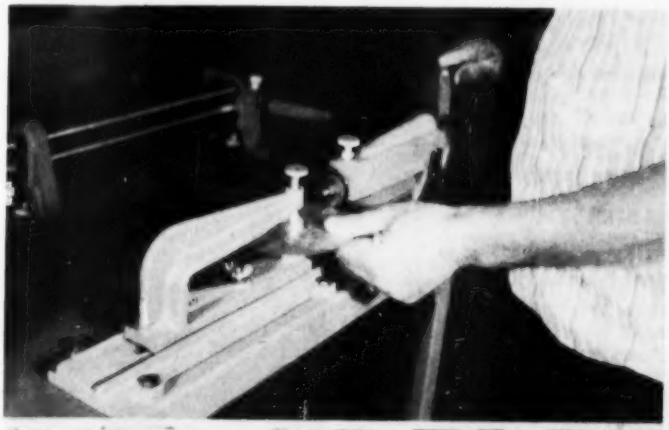
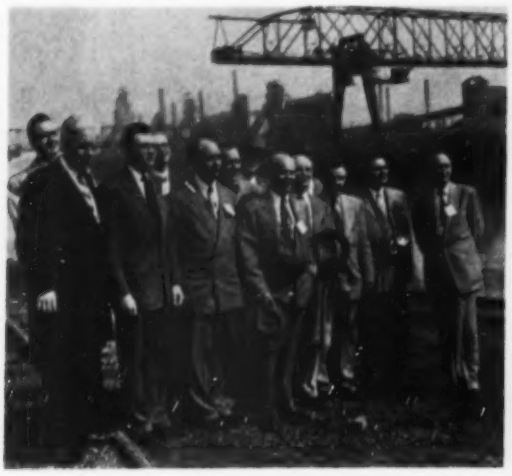
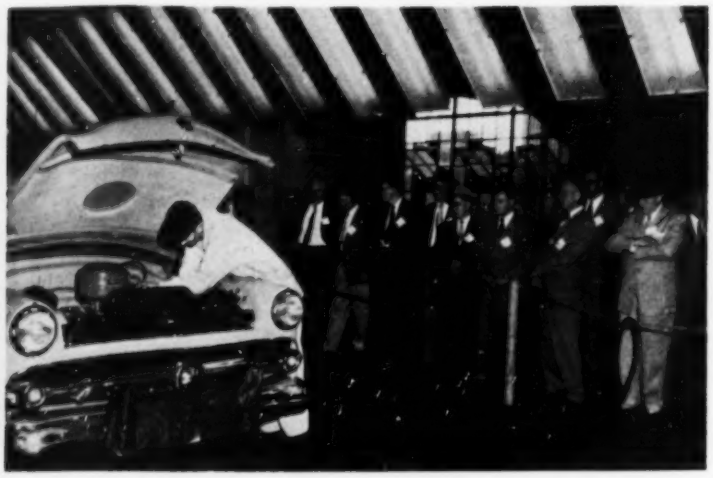


Fig. 4 (Upper). Cutting out the round book end uprights on the ring and circle shear

Fig. 5 (Lower). A complete metalworking setup

Theories of the origin of oil are many and conflicting, but oil is generally believed to be of organic origin, derived from marine organic matter. Some day, it may be proved that oil was formed at normal, sea-bottom temperatures in warm waters which are about 68 deg. F. The youngest known accumulation of oil is found in rocks of Pliocene age, one million years old. — *Petroleum Newsnotes.*





Members of the Milwaukee Industrial Arts Teachers' Association from Boy's Tech High School and Boy's Tech Annex inspect Ford Motor Company's boat slip facilities and the assembly line at the 1,200-acre Rouge plant in Dearborn, Mich., during the association's annual spring tour.

The teachers are, from left to right, Lloyd Thomas, Melvin Olson, Elroy Pinkert, Vance Tatge, August Sutter, Gregory Schreiner, Edwin Kendziorski, Gustave Mickelson.

Second row, Harvey Barthel, Donald Brown, Gilbert Jautz, Leo Holliday, and Wilbur Vance.

TEACHERS CHARTER AIRPLANE FOR FIELD TRIP

R. A. RADTKE
Director of Industrial Arts
Milwaukee Public Schools
Milwaukee, Wis.

As has been the custom for many years, the Milwaukee industrial-arts teachers spend one day of their Easter vacation on a field trip. A few of the places visited in the past have been the Steel Mills in Gary, Ind., the Museum of Science and Industry in Chicago, and the Forest Products Laboratory in Madison. This year the Milwaukee industrial-arts teachers spent Tuesday, April 20, touring the famous Rotunda automotive showplace and giant Rouge plant area of Ford Motor Company, and visited the nearby Henry Ford Museum and Greenfield Village, in Dearborn, Mich.

The 54 members of the teacher group arrived at Detroit's Willow Run airport from Milwaukee by chartered plane early in the morning, and boarded Ford buses for the day-long industrial and historical outing. A motor tour of the 1200-acre Rouge plant area included stops at the company's blast furnaces, boat slip, steel mills, and final automobile assembly line. The teachers later walked the length of the 1620-ft. assembly line to see at first-hand how mass production methods are used to turn out automobiles at the rate of one car every 55 seconds.

After lunch at historic Clinton Inn in Greenfield Village, which was once the first stage stop between Detroit and Chicago, the members toured Greenfield Village, Thomas Edison's Menlo Park laboratory, and the mechanical-arts collection of the Ford Museum.

Getting ready to embark for the trip home

In the evening the teachers were dinner guests of the Ford Educational Relations Department. After dinner they toured the Ford Rotunda and its exhibits which depict creative research and engineering. The evening program was climaxed at the Rotunda theater by a motion picture, "Technique for Tomorrow," which showed the advances made in the automatic handling and transportation of automotive parts machining operations. After attending the movie the teachers returned to Willow Run airport for the return flight to Milwaukee, tired but very happy over their unique experience.

A POINT SYSTEM OF GRADING DRAWINGS

A. G. FRIESE
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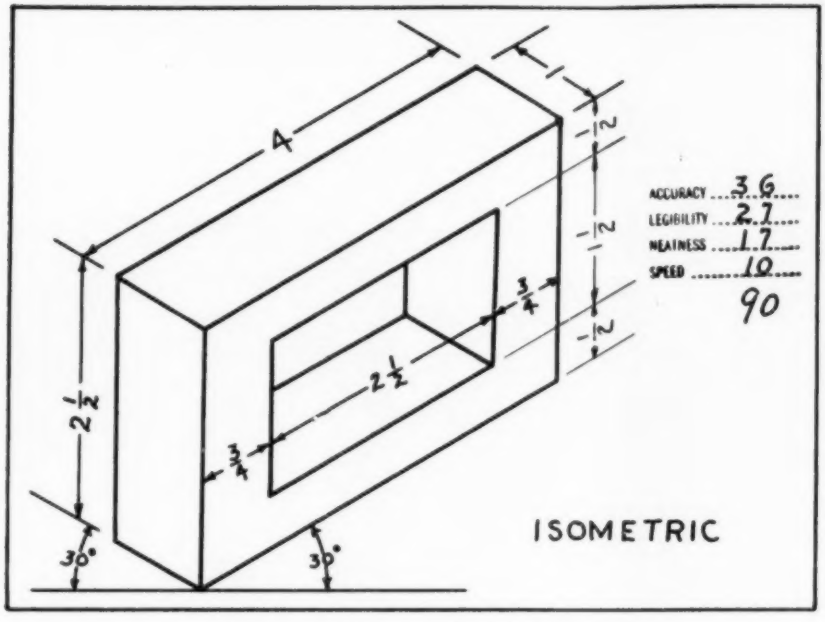
There are probably as many ways of grading drawings as there are drawing in-



A point system in grading drawings

structors. Grades are given, but it is doubtful if the instructor could satisfactorily explain to the student just how he arrived at a particular grade. There should be a more definite system of assigning grades and there should be a means of justifying them.

On the junior high level, the point system described herewith has been found advantageous. This arrangement is to be preferred because most students are familiar with this system and it is easy to administer, since it allows the instructor a finer differentiation between scores than does the A, B, C system. Furthermore, in determining the student's six-weeks, nine-weeks, or semester grade it resolves itself into a simple mathematical average, thereby making the grade more objective and impersonal.

To enable the student to see where his work needs improvement, the four specific aims in drawing were arranged into four categories, in their order of importance, the the following point weights were assigned to each category:

Accuracy	40 points
Legibility	30 points
Neatness	20 points
Speed	10 points
	100 points

These four words were then made into a rubber stamp (cost about $1.60) leaving the point column blank. When completed drawings are handed in, this stamp mark is placed upon them before filing them away to be graded at a later time.

Accuracy is the rating given for ability to measure and draw lines to an exact length. For seventh graders an error of 1/16 inch is acceptable, but for students on a higher grade level the size of the error may be decreased. Accuracy also includes the proper spacing of the views, proper dimensioning, and correct solution of the problem. If all measurements and solutions are correct a maximum of 40 points can be earned.

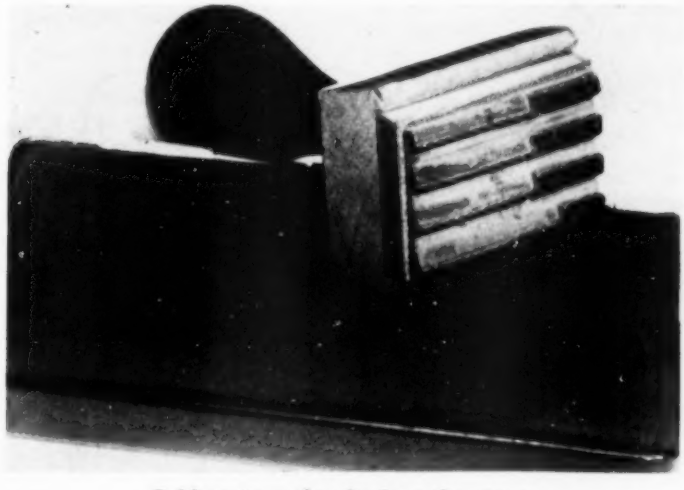
Legibility is the rating on ability to draw the conventional lines, giving each one its particular weight and size. This also includes lettering, both on the drawing and in the title block. A maximum of 30 points can be earned.

Neatness is the rating on the general appearance of the drawing paper, including such factors as fingerprints, number of poor erasures, and smudgy lines. A maximum of 20 points can be earned.

Speed, the last of the four aims, is assigned a maximum of 10 points. In this day and age speed is such a vital factor that it should not be overlooked in our classrooms and some attempt should be made to teach it by practical application. The maximum of points can be earned if the student has completed a drawing by a specific date. The instructor should designate the date on which the average of the class will complete a given drawing and for each day that he is late one point should be deducted. For the superior student who completes drawings ahead of schedule, additional drawings should be assigned for which he can earn extra credit. This gives him an incentive to keep busy and do additional work.

This point system certainly has put more meaning into my drawing grades and has made it easier to justify my report card grades. It also has increased the quality of the work of the student because it indicates specifically to him where his work needs improvement. However, it should not be overlooked that the student must understand the point system and just what is included in each category. Periodic reviews are worth while.

If this particular point system doesn't meet your needs, alter it accordingly. Perhaps you would like to add one or two categories or divide the present ones into smaller units. Perhaps you would like to change the maximum points assigned to each category. However, give it a try; you will find that it does give more meaning to your grades.

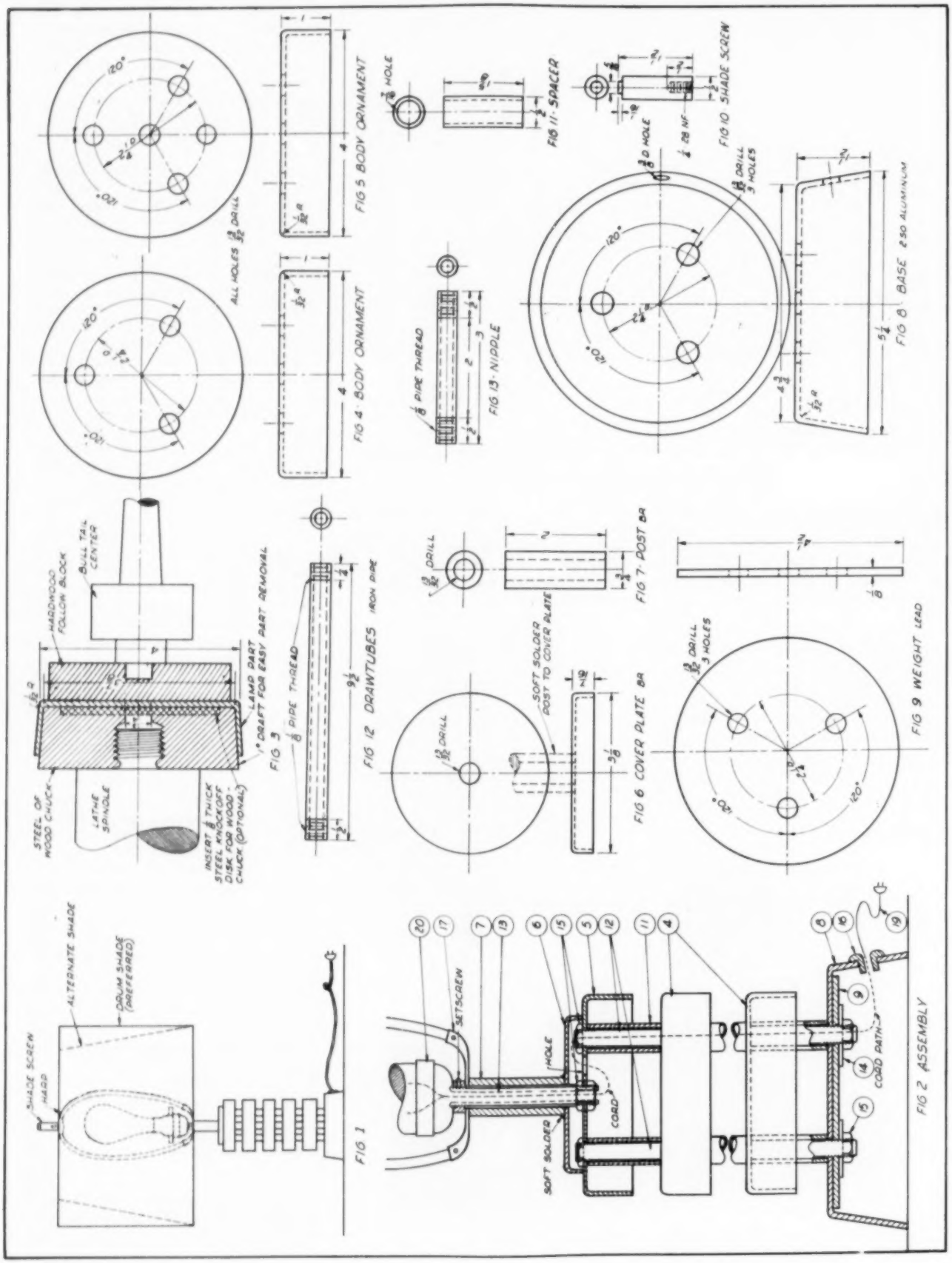


Rubber stamp for checking drawings

MODERN SPUN LAMP

R. W. WILLIAMSON
Assistant Professor
Industrial Arts Department
Oregon State College
Corvallis, Ore.

Here, within easy grasp of the beginner in metal spinning, lies a project that has the air, size, and appearance of truly ad-



Details of the modern spun lamp

vanced work. One of the eternal problems encountered by the instructor of metalcraft is that of teaching basic spinning without utilizing the ever present and overworked bowl as a teaching vehicle. The whole thought and purpose behind this design is to side-step the bowl problem.

The modern spun lamp

The lamp shown embodies enough repetition and variety in fundamental operations to build basic skills without using large or costly materials — in fact many of the parts may be drawn from the scrap or shorts box. This spun project is a great confidence maker, too, because if one part were ruined through faulty technique or lack of new skills, the whole does not have to be thrown away; only the faulty part need be remade to save the job.

Suggested Procedure

1. Tap and screw directly onto the spindle of the lathe (or mount on a suitable faceplate) a piece of maple and turn spinning chuck for part No. 4 — see Fig. 3 and Fig. 4. (NOTE: If many lamps are to be made, it is highly recommended that a simple steel chuck be made rather than one of wood; the spun shells will planish out smoother, chuck will last longer, and above all will release the work piece from the chuck with greater ease. If trouble is encountered in getting the parts to release from the chuck, either wood or metal, a small steel plate about ⅛ in. thick by 3 in. in diameter can be loosely inset into the face of the chuck — see Fig. 3. The headstock knockout rod is then used as a ramrod to remove the finished part without distorting it.)

2. Place aluminum blank between chuck and follow block.

BILL OF MATERIALS

Fig.	*Amount*	*Part*	*Material*	*Size*
4	4	Body ornaments	2S0-aluminum	14 ga. x 5¼ in. dia.
5	1	Body ornament	2S0-aluminum	14 ga. x 5¼ in. dia.
6	1	Cover plate	Brass	3/32 x 3 9/16 in. dia.
7	1	Post	Brass	¾ dia. x 2⅛ in. long
8	1	Base	2S0-aluminum	No. 14 ga. x 7⅛ in. dia.
9	1	Weight	Sheet lead	⅛ x 4½ in. dia.
10	1	Shade screw	Brass	½ dia. x 1½ in.
11	15	Spacers	Brass tubing	½ in. o.d. x 7/16 in. i.d. x 1⅝ in.
12	3	Draw tubes	Black iron pipe	⅛-in. pipe x 9½ in. long
13	1	Nipple	Black iron pipe	⅛-in. pipe x 3 in.
14	3	Washers	Steel — purchase	⅜ hole size
15	8	Nuts	Steel — purchase	Thin electric — for ⅛-in. pipe
16	1	Bushing	Rubber — purchase	⅜-in. size
17	1	Harp	Purchase	10 or 11-in. size
18	1	Shade	Purchase (drum type preferred)	14 or 15-in. diameter
19	1	Cord and plug	Purchase	8 ft.
20	1	Push button light socket	Purchase	⅛-in. pipe screw base

3. Set lathe to about 1000 r.p.m. speed.

4. Lubricate disk with grease (professionals use Standard Oils No. 4 grease as it has little tendency to fly off on to the operator).

5. Using a ¾-in. diameter hardened bullet-pointed tool or broomstick, spin aluminum down to chuck with quick decisive thrusts — driving and anchoring the metal to the chuck as work progresses. Keep the unset metal in a bell-like curve flaring to the *left* of the operator. Never let the unset metal curl toward the tailstock.

6. Trim and polish with 2/0 sandpaper. (Sandpaper gives a richer satin finish than does aluminum oxide cloth.)

7. Spin four more as above.

8. Make a maple chuck and spin base. (Flare of base eliminates need for knockout disk as in part No. 4.) Polish as above. Remove.

9. Make chuck and spin brass cover plate — Fig. 6. Annealing may be necessary. Polish with 2/0 sandpaper as before.

10. Chuck post (part No. 7) in 3-jaw chuck. Face and drill through with 13/32-in. drill. Remove and rechuck to face other end to length. Polish in lathe with 2/0 sandpaper.

11. Solder post to cover plate by standing post upright in center of cover plate. Flux, drop small bits of soft solder in drilled hole and heat to fusion with a small torch.

12. Place soldered assembly in chuck of lathe by holding onto the post. With 13/32-in. drill in tailstock drill through cover plate and re-drill post to remove excess solder. With a sharp-pointed tool, carefully trim edge of cover plate while still in the lathe. Remove.

13. Lay out and cut lead weight with tin snips. Fasten with rawhide mallet over bench block.

14. Lay out and drill 13/32-in. holes in parts Nos. 4, 5, 8, and 9. (NOTE: Variance of No. 5.)

15. Rotate and polish a two-foot length of ½-in. brass tubing with 2/0 garnet paper while held in a lathe or drill press.

CAUTION: Use lathe tailstock — revolve slowly in drill press if that is used.

16. Cut and turn 15 bushings to correct length — jigs may be devised to assist in this operation as it is highly important that all the bushings be closely *uniform* in length to prevent the lamp from leaning.

17. Cut and thread four pieces of ⅛-in. pipe as shown. Continuously threaded ⅜-in. pipe (¾-in. outside diameter) may be substituted.

18. Clean *all* brass with lacquer thinner, dry off and lacquer to inhibit tarnish.

19. Wax all aluminum parts with floor wax. Let stand five minutes. Rub briskly to bring out luster.

20. Assemble short 3-in. nipple into part No. 5 as shown with an electrical type nut above and one below. Lock these two securely against each other using two wrenches.

21. Assemble lamp body as shown. (NOTE: Leave room for cord to pass between the top end of one 9½-in. pipe and the brass cover plate — see Fig. 2.)

22. Insert insulating bushing No. 16.

23. Thread cord through one draw tube as shown by dotted line, Fig. 2.

24. Drop assembled cover plate over 3-in. pipe nipple thus concealing all wiring and unsightly draw nuts.

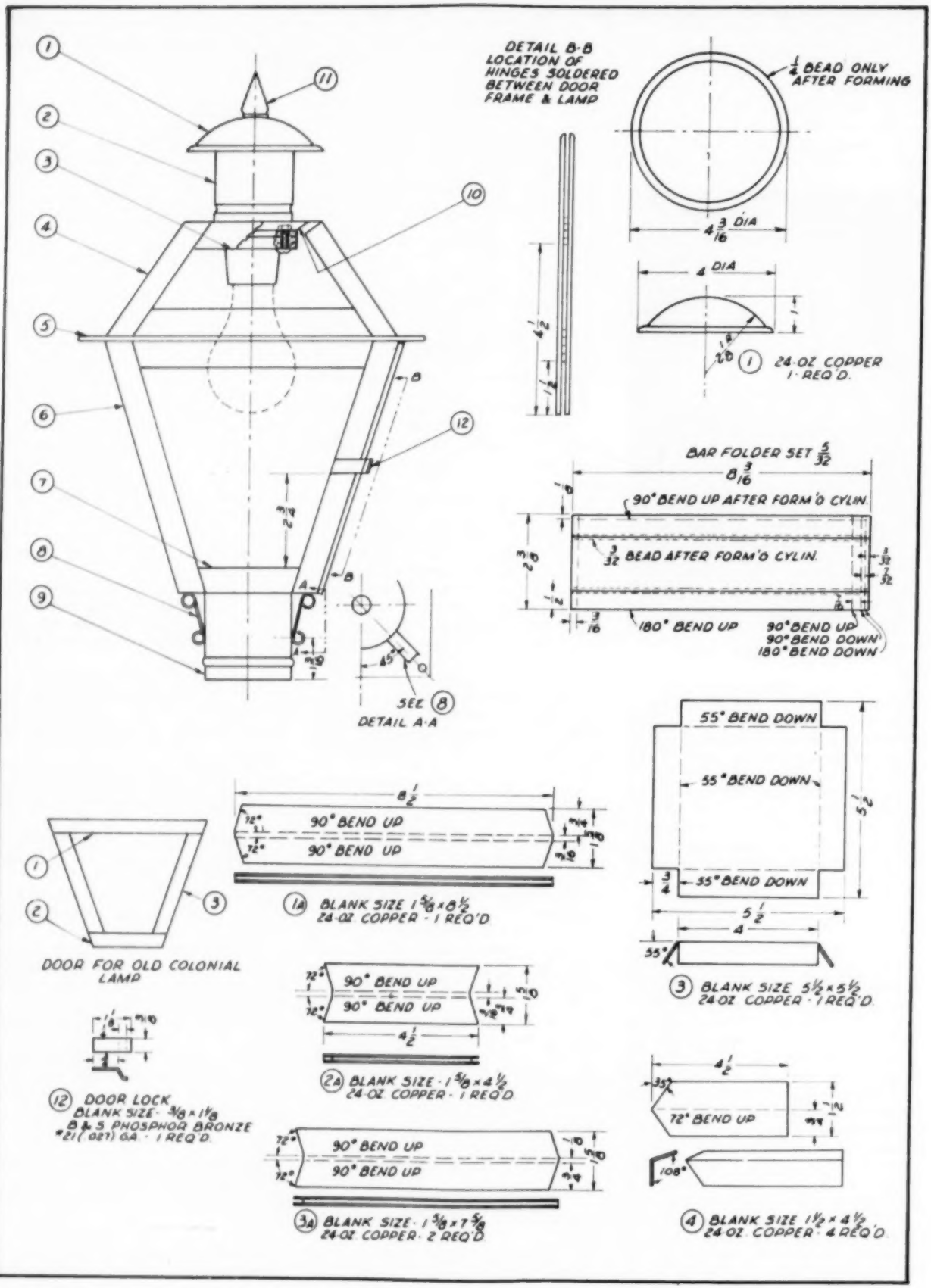
25. Place wire shade support device (harp) over exposed nipple and screw on base of electric light socket. Tighten firmly and lock with small setscrew in socket.

26. Finish by completing the electric wiring.

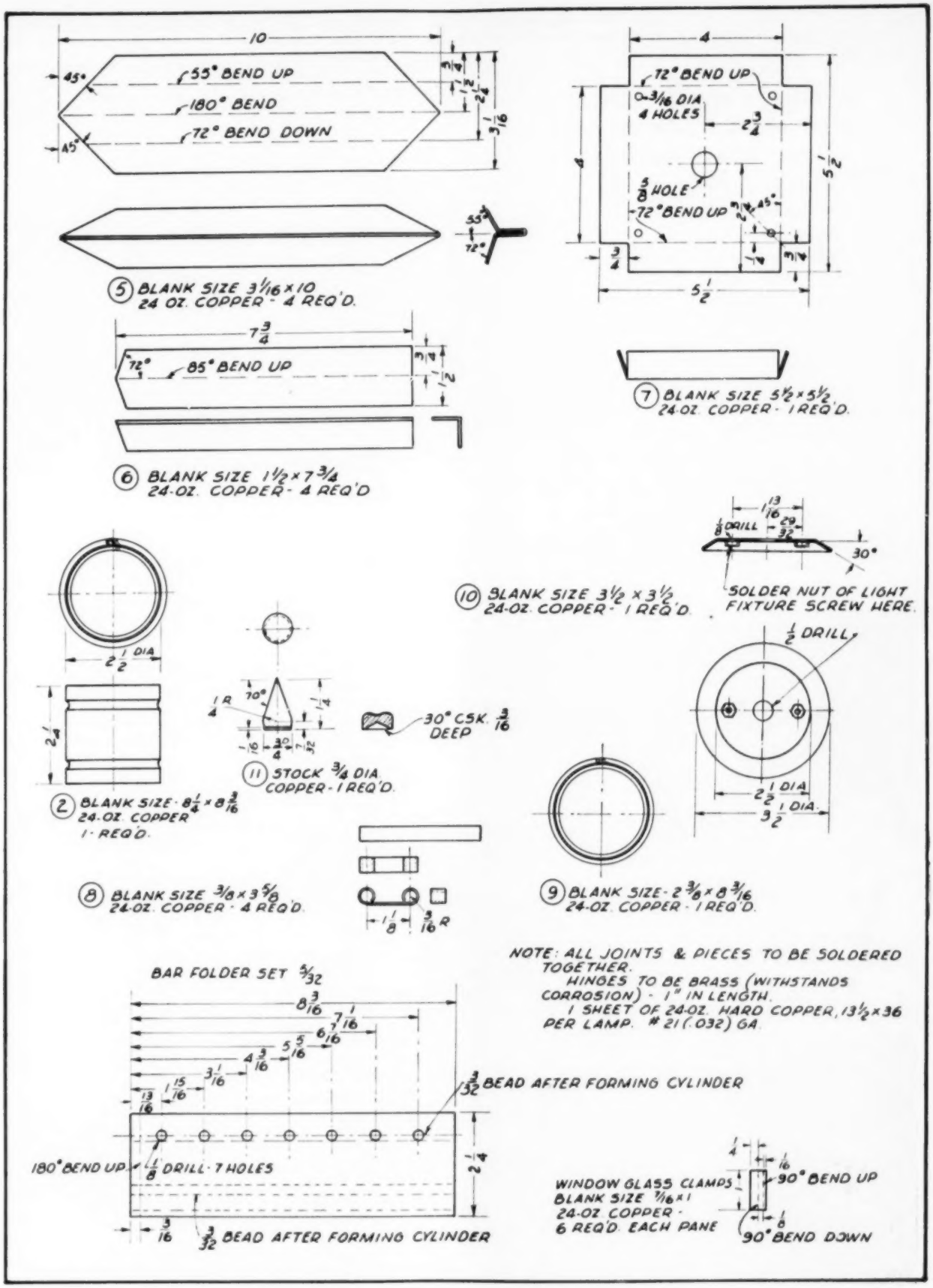
27. Fit shade. (NOTE: Although picture shows a bell-shaped shade, the drum type will carry out the modern theme and is preferred.)

No person was ever honored for what he received. Honor had been the reward for what he gave. — CALVIN COOLIDGE.

Instructional aids are all types of audio and/or visual materials used to supplement instruction. — *Los Angeles City Schools Shop News.*


DETAIL B-B
LOCATION OF HINGES SOLDERED BETWEEN DOOR FRAME & LAMP
1/4 BEAD ONLY AFTER FORMING
4 3/16 DIA
4 DIA
1 24-OZ COPPER 1 REQ'D.
BAR FOLDER SET 5/32
8 3/16
90° BEND UP AFTER FORM'D CYLIN.
3/32 BEAD AFTER FORM'D CYLIN.
180° BEND UP
90° BEND UP
90° BEND DOWN
180° BEND DOWN
SEE 8
DETAIL A-A
55° BEND DOWN
55° BEND DOWN
55° BEND DOWN
3 BLANK SIZE 5 1/2 x 5 1/2
24-OZ COPPER - 1 REQ'D
8 1/2
90° BEND UP
90° BEND UP
1A BLANK SIZE 1 5/8 x 8 1/2
24-OZ COPPER - 1 REQ'D
DOOR FOR OLD COLONIAL LAMP
90° BEND UP
90° BEND UP
4 1/2
2A BLANK SIZE - 1 5/8 x 4 1/2
24-OZ COPPER - 1 REQ'D
12 DOOR LOCK
BLANK SIZE - 3/8 x 1 1/8
B & S PHOSPHOR BRONZE
#21 (.027) GA. - 1 REQ'D.
90° BEND UP
90° BEND UP
3A BLANK SIZE - 1 5/8 x 7 5/8
24-OZ COPPER - 2 REQ'D
4 1/2
72° BEND UP
108°
4 BLANK SIZE 1 1/2 x 4 1/2
24-OZ COPPER - 4 REQ'D

The Colonial post lamp and details by Walter H. Harrington, head of engineering drafting, New Hampshire Technical Institute, Manchester, N. H.



Further details of the Old Colonial post lamp by Walter H. Harrington

COMBINATION VERTICAL DRAFTING MACHINE AND CHALK BOARD ILLUSTRATOR

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Senior High School
Fond du Lac, Wis.

The combination vertical drafting machine and chalk board illustrator has two potential characteristics that make it a valuable teaching device.

Its first importance lies in the challenge it offers to teachers and students in working accurately with machines and hand tools to the extent of mating parts with close tolerances.

Its second and most important value lies in the application of the finished project to the teaching of drafting. As an aid to the drawing teacher, this machine can become a very useful teaching device, in illustrating the functions of drawing. The teacher wishing to demonstrate, either on the chalk board or large vertical board, need only place a unit such as this before the class and start drawing; at once the presentation becomes the center of interest. Students like a learning situation when the instructor takes part by drawing along with them.

Fig. 1. Making a detail drawing

Fig. 2. A class working at the vertical drafting boards

One way in which the author uses the machine to advantage is by making a chalk board drawing of a small casting doubling the size, then having the students draw the object full size on their drawing boards.

Figure 1 shows how a drawing of a casting can be presented to carry out this idea.

This work can be done by a step-by-step procedure, giving the students a direct comparison between the instructor's work and their own efforts. It makes the learning situation more fascinating and inspirational than constantly assigning problems from a textbook. Here is an excellent opportunity for teachers to practice methods of presentation. The work requires extra effort on the part of the teacher but offers a rich reward in increased student interest. It opens a new approach to the teaching of the subject.

Students like to work with vertical boards and drafting machines, and it is possible for them to do so if you mount the vertical drafting machines on vertical drawing boards and place them around the room as shown in Figure 2. There is a lot of work they can do on them. Full size furniture designing, large assemblies, boat frame layouts, large architectural drawings, and topographic map drawing are some of the examples.

Figure 2 shows a class in session using the vertical drawing boards and machines to make full size furniture designs and large assembly drawings.

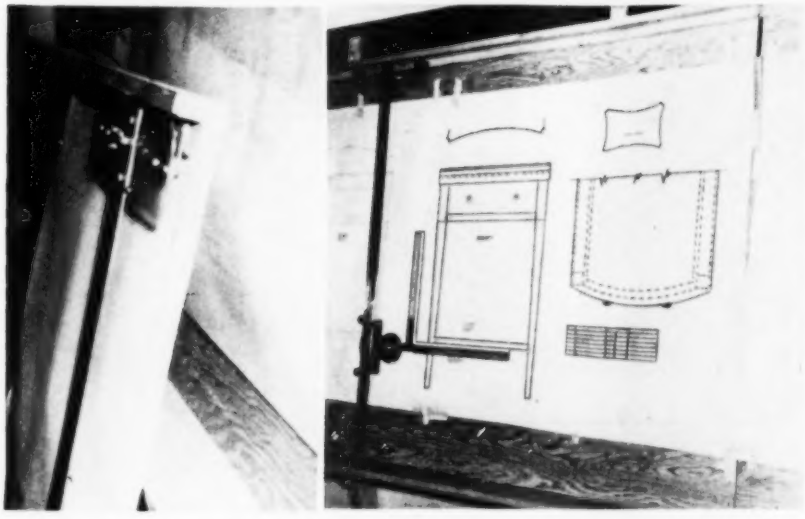


Fig. 3. A close-up showing the board and vertical drawing unit. Fig. 4 shows the application of the vertical drafting machine to making full-size furniture designs

Figure 3 shows how the vertical drafting machine can be mounted on a drawing board.

Figure 4 shows one of the pieces of furniture which was designed in our class last year.

The Front Chalk Board Equipped With the Vertical Drawing Machine

Rigging up the chalk board, as shown, can be done by mounting standard No. 600 Washington track on the top frame of the blackboard, along with the top ¾ by 2-in. strip as shown.

The board is made of ½-in. fir plywood, 4 ft. wide and 5 ft. long. Plane a 10-deg. angle on the back upper edge of the board, and mount two No. 601 SN Washington rollers on the bottom edge. These will roll in the chalk tray of the blackboard, allowing the board to be moved to any position in front of the room. The board will slide under the drafting machine at any position allowing the instructor to do large board work at any time in full view of the class.

Changing ruling heads is all that is necessary to convert the machine from blackboard to drawing board work. See Figure 6 for the various types of ruling heads.

Converting the Drafting Machine from Blackboard Work to Drawing Board Use

In converting this machine there are three ruling heads that can be employed to meet the demonstrating situation required.

The Pictorial Ruling Head

This attachment enables the demonstrator to make isometric and oblique drawings without changing the position on the protractor.

Figure 7 shows the pictorial head in position on the drafting machine.

The Orthographic Blackboard Ruling Head

Figure 8 shows an attachment which has pattern openings that speed up the drawing of hexagons and circles. It is used for orthographic drawings of all kinds.

The Drafting Head

The attachment shown in Figure 9 allows the demonstrator to do large vertical board work.

Figure 10 shows a service board to be located at one end of the blackboard for convenience in changing ruling heads and storing other instruments used in demonstrating. It also shows how the drawing board slides under the blackboard drafting machine making it possible to do board work in front of a class.

These three attachments make the vertical drafting machine practical for any teaching situation where illustrations are required.

Making the Project

This project can be made in a shop with limited equipment. The machines necessary to complete the work consist of a metal-turning lathe, a drill press, and the hand tools found in the average industrial-arts department.

No. 302 The Sliding Head

This part has Washington rollers mounted on it which roll in the Washington track at the top of the board.

1. Cut a piece of ⅛ wal-lite 3½ in. wide by 12 in. long.

2. Locate and drill 3/16 holes for 8–32 by ½ button head screws to hold the Washington rollers.

NOTE. If this part is made of Plexiglas be sure the drill you use has a negative

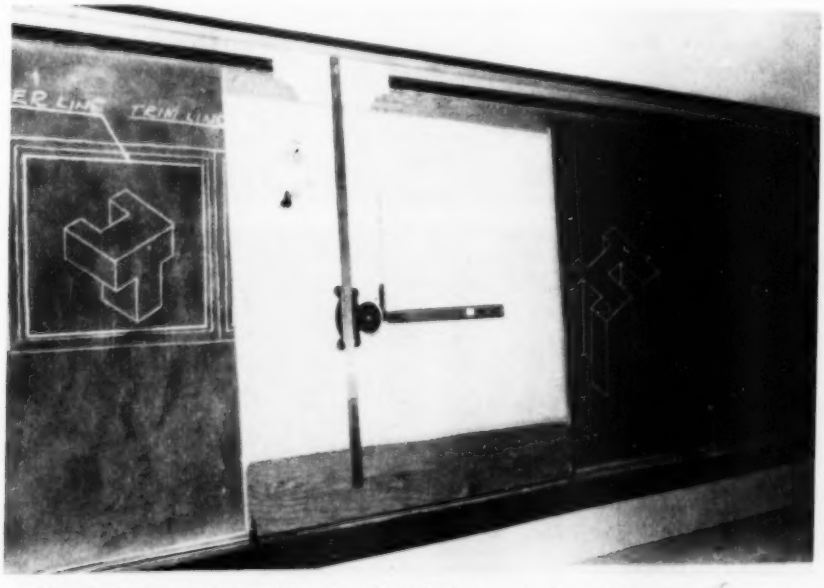


Fig. 5. Using the drawing board with the vertical machine. The change can be made by simply changing the ruling heads. This drawing board is provided with rollers at the bottom so that it can be placed in any position along the front of the room. It just slides under the drafting machine

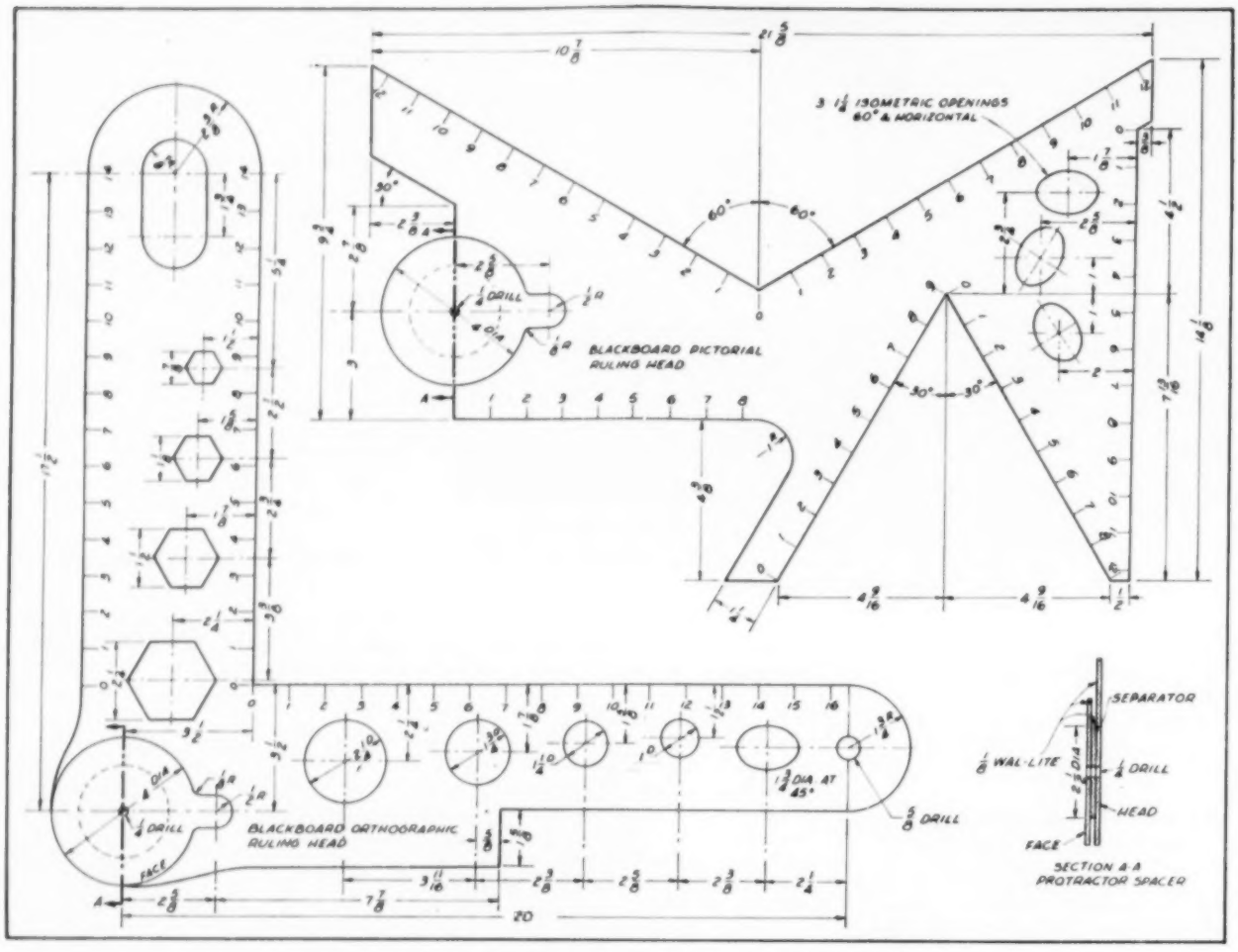


Fig. 6. Details of orthographic and pictorial ruling heads

rake to eliminate the cracking of the Plexiglas.

3. Round off the top corners as shown on the drawings.

4. Smooth and polish all edges.

5. Locate and drill the remaining holes required.

6. Assemble Washington rollers and this part.

The No. 303 Upright Beam

1. Cut a piece of ⅛ by 1½ cold-rolled steel 4 ft. long.

2. File one end square and break sharp corners, then round off the other end.

3. Drawfile the edges using the file lengthwise, getting a jointing action.

4. Lay out the location of the holes to be drilled. Center punch and drill.

5. Polish with abrasive cloth, clean and apply a coat of lacquer.

Fig. 7. The pictorial head

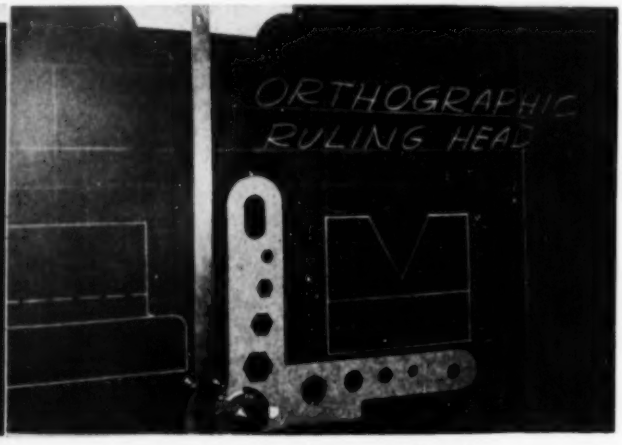


Fig. 8. The orthographic head

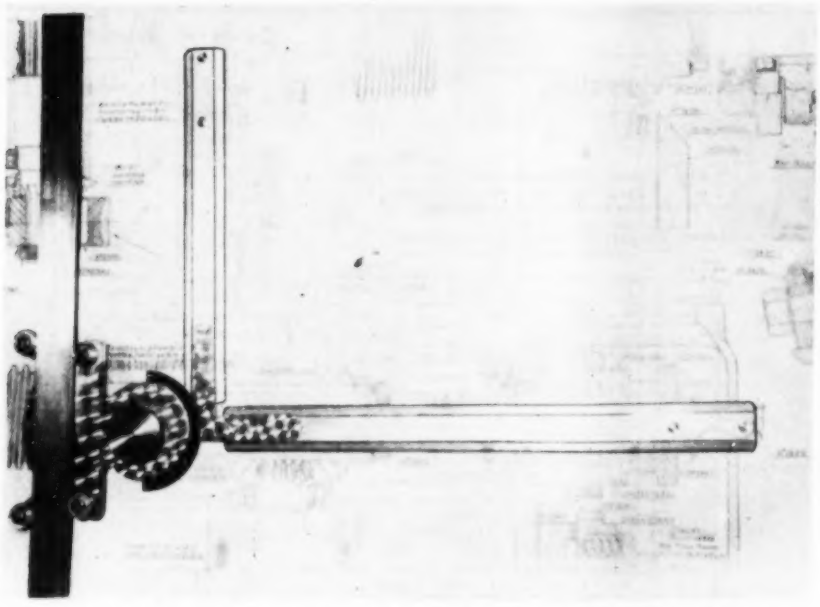


Fig. 9. This is a close-up view of the sliding protractor unit. This unit makes possible the setting of the scales to any angle. Scales can be adjusted to each other in order to get the 90 deg. to accurate position

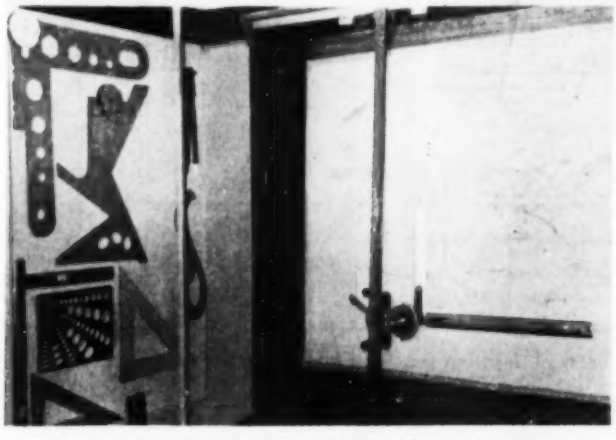


Fig. 10. Drafting machine and accessories

The No. 306 Sliding Protractor

1. Lay out the shape of the protractor according to the dimensions on the drawing.
2. Rough out the shape with a hack saw, then form more accurately to the line.
3. Lay out the center lines and holes to be drilled.
4. Center punch, drill and tap.
5. File finish all edges and polish with abrasive cloth.
6. Solder the protractor in place. Protractor No. 1552. Purchase from Post, Milwaukee, Wis.
7. Apply two coats of clear lacquer.

The No. 308 Protractor Fork

1. Lay out the shape of the fork on a piece of ⅛-in. sheet steel.

The No. 307 Hand Nut

This is a lathe chucking job to be done on a metal turning lathe.

1. Cut a piece of 2-in. dia. mild steel rod two inches long.
2. Place the stock in the lathe chuck and face one end.
3. Reverse in chuck and take a rough cut to $1\frac{15}{16}$ dia.
4. Face the end as shown in the print.
5. Knurl a portion of the surface and rough out the concave section.
6. File finish the concave part.
7. Polish the end and concave part with abrasive cloth and oil.
8. Before removing the stock from the chuck drill the pilot hole to be threaded.
9. Remove the stock from the lathe chuck and top ¼–20 thread.
10. Apply two coats of clear lacquer.

The No. 304 Levers (3 Required)

1. Cut three pieces ⅛ × ¾ × 3-in. hot rolled steel strap iron and clean off oxidized scale.
2. Lay out the location of the holes to be drilled, center punch and drill.
3. Using the conscribing dividers scribe the shape of the levers.
4. Form to shape.
5. File finish and polish with abrasive cloth.
6. Bend to shape.
7. Apply two coats of lacquer.

The No. 305 Brass Rollers (5 Required)

1. Place a piece of 1-in. dia. brass rod 6 in. long in a lathe chuck.
2. Place a Jacob Chuck with a $\frac{15}{64}$-in. drill in the tailstock of the lathe and drill into the brass rod as far as the drill will go.
3. Countersink the end of the rod to fit tailstock center.
4. With tailstock center in place turn to ⅞ in. dia. Turn back about five inches.
5. Using a cutoff tool, cut grooves laying out the size of each roller and cutter space.

NOTE: Do not cut grooves to their proper depth until later.

6. Place the work in a chuck, cut the rollers off to their proper length.
7. Ream each roller to fit a ¼ mandrel.
8. Mount mandrel and stock on the lathe and finish all over.
9. File finish, break corners, and polish on the lathe.
10. Countersink the hole on each side of the roller to remove the burr formed by turning.
11. Give all rollers a coat of clear lacquer.

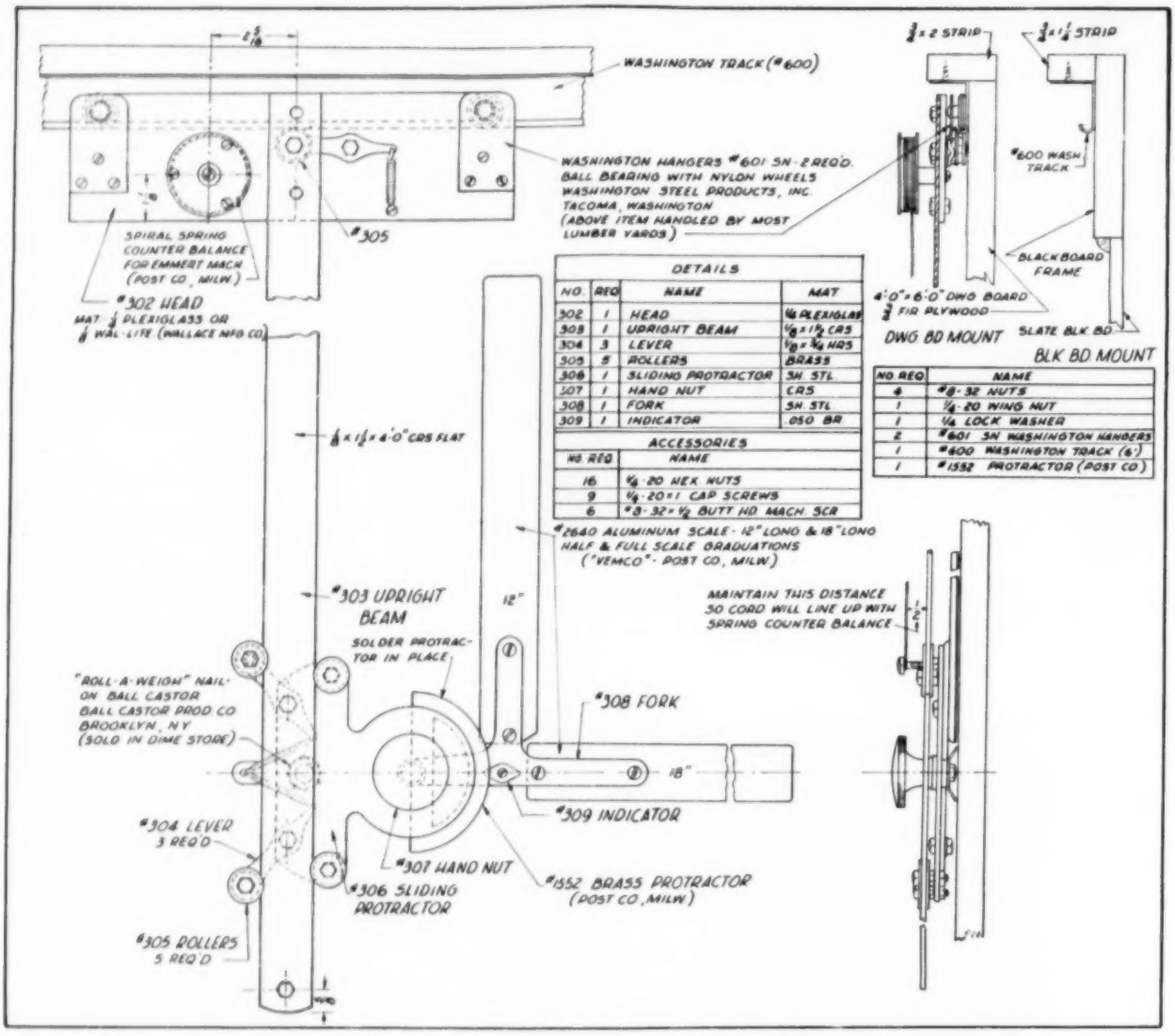
The No. 309 Indicator

1. Drill a No. 8 hole in a piece of sheet brass — 18 to 20 gauge.
2. Lay out the shape of the indicator around the drilled hole.
3. Cut to shape with tin snips.
4. File finish and polish.
5. Scribe the line to indicate zero.
6. Bend down the end to fit in a No. 29 hole.

Assemble the parts as shown.

Adjusting the Machine to the Vertical Drafting Board

1. Cover the board with a backing sheet. Bordex is a backing sold by Post Company and makes an ideal cover for this type board.


WASHINGTON TRACK (#600)
WASHINGTON HANGERS #601 SN - 2 REQ'D. BALL BEARING WITH NYLON WHEELS WASHINGTON STEEL PRODUCTS, INC. TACOMA, WASHINGTON (ABOVE ITEM HANDLED BY MOST LUMBER YARDS)
SPIRAL SPRING COUNTER BALANCE FOR EMMERT MACH. (POST CO., MILW.)
#305
#302 HEAD
MAT. 1/8 PLEXIGLASS OR 1/8 WAL-LITE (WALLACE MFG CO.)
1/8 x 1 1/2 x 4'0" CRS FLAT
#303 UPRIGHT BEAM
SOLDER PROTRACTOR IN PLACE
"ROLL-A-WEIGH" NAIL-ON BALL CASTOR BALL CASTOR PROD CO BROOKLYN, N.Y. (SOLD IN DIME STORE)
#304 LEVER 3 REQ'D
#305 ROLLERS 5 REQ'D
#306 SLIDING PROTRACTOR
#307 HAND NUT
#308 FORK
#309 INDICATOR
#1552 BRASS PROTRACTOR (POST CO., MILW.)
#2640 ALUMINUM SCALE - 12" LONG & 18" LONG HALF & FULL SCALE GRADUATIONS ("VEMCO" - POST CO., MILW.)
12"
18"
MAINTAIN THIS DISTANCE SO CORD WILL LINE UP WITH SPRING COUNTER BALANCE
3/4 x 2 STRIP
3/4 x 1 1/4 STRIP
#600 WASH. TRACK
BLACK BOARD FRAME
4'0" x 6'0" DWG BOARD 3/4 FIR PLYWOOD
SLATE BLK BD
DWG BD MOUNT
BLK BD MOUNT

DETAILS

NO.	REQ	NAME	MAT
302	1	HEAD	1/8 PLEXIGLAS
303	1	UPRIGHT BEAM	1/8 x 1 1/2 CRS
304	3	LEVER	1/8 x 3/4 NRS
305	5	ROLLERS	BRASS
306	1	SLIDING PROTRACTOR	SH. STL.
307	1	HAND NUT	CRS
308	1	FORK	SH. STL.
309	1	INDICATOR	.050 BR

ACCESSORIES

NO. REQ	NAME
16	1/4-20 HEX. NUTS
9	1/4-20 x 1 CAP SCREWS
6	#8-32 x 1/2 BUTT HD. MACH. SCR

NO. REQ	NAME
4	#8-32 NUTS
1	1/4-20 WING NUT
1	1/4 LOCK WASHER
2	#601 SN WASHINGTON HANGERS
1	#600 WASHINGTON TRACK (6')
1	#1552 PROTRACTOR (POST CO.)

Fig. 11. Details of combination vertical drafting machine and chalk board illustrator

2. Place a piece of layout paper on the board.

3. Bring your machine over to the left side of the board and slide the protractor up to about the middle.

4. Hold one of the rollers to the vertical beam with your left hand and draw a horizontal line across the board sliding the machine on the track. This gives you a line parallel to the track.

5. Then set your horizontal scale to match this line.

6. Set the indicator to zero on the protractor.

7. Using a large triangle, set the vertical scale right angles to the horizontal scale. Your machine is now orientated to your board. To counterbalance the sliding protractor use large rubber bands or purchase a spring counterbalance for an Emmert drafting machine from the Frederick Post Company, Milwaukee, Wis.

EVALUATION THROUGH FOLLOW-UP

ALBERT E. JOCHEN
Director
Middlesex County Vocational School
New Brunswick, N. J.

We in vocational education are dedicated to a program which has as one of its controlling purposes the training of an individual for useful employment in a particular trade or industrial pursuit.

Our graduates must be able to fit into an industrial situation which in a sense is ever changing; ever in a state of flux not only from a standpoint of job technique, new materials, and invention of productive machinery but also from a standpoint of social progress and new concepts in human engineering.

Successful adjustment in such a changing industrial picture naturally requires concomitant change and progress in our vocational school curricula. It is, of course, understood that certain basic fundamental skills, processes, techniques, and concepts will probably always remain as an essential part of every trade and these basic fundamentals will form the core of our trade and industrial training curricula.

If we as vocational educators are agreed on the above premises, then we must of necessity dedicate ourselves to a program of perpetual evaluation and revision of our curricula.

The sixty-four dollar question now becomes, "How best can we accomplish this continuous evaluation?" The answer to this question, the writer be-

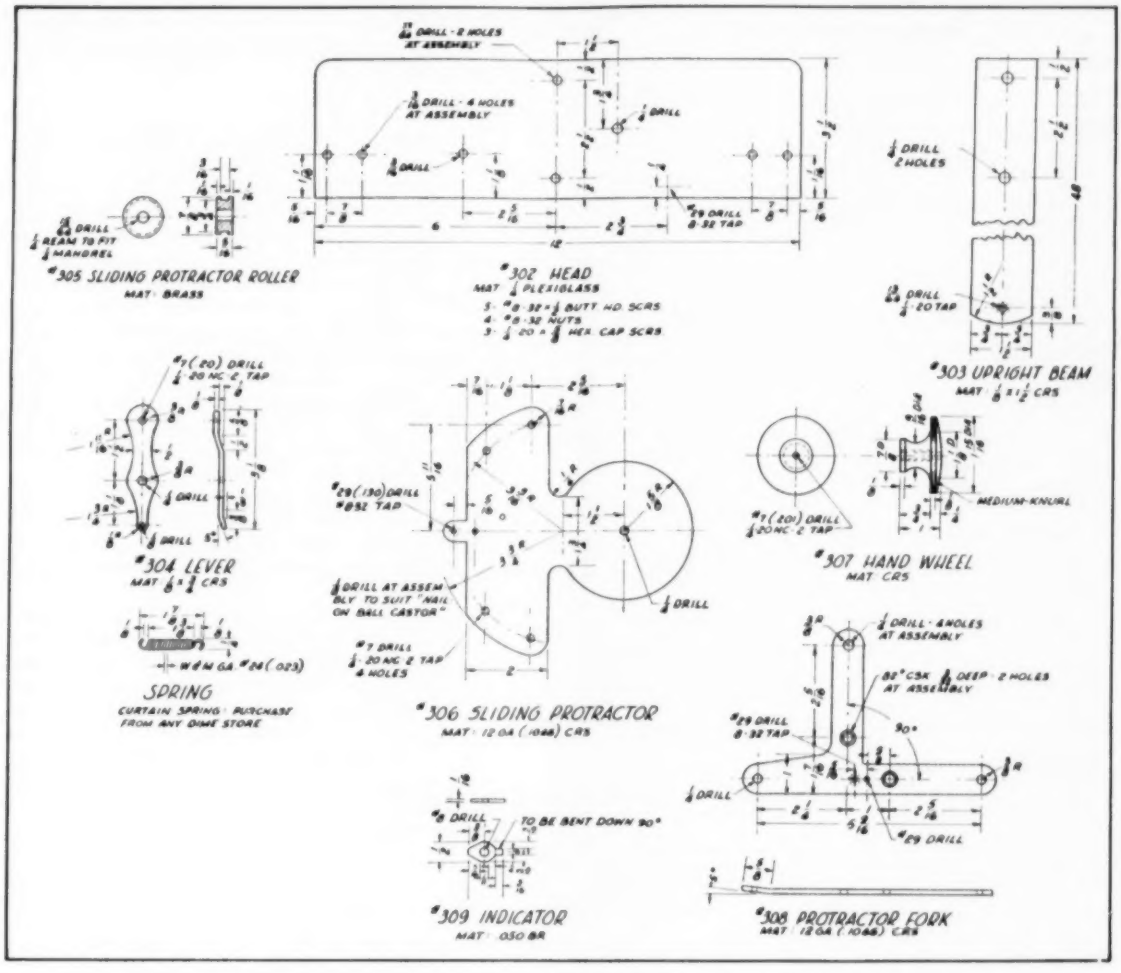


Fig. 12. Details of combination vertical drafting machine and blackboard illustrator

lieves, rests in our placement and follow-up program — a service which we in vocational education should never relinquish and which we should jealously guard as our particular prerogative, our rock upon which sound vocational programs are built. What better method is there for an evaluation of a product than a critical analysis by the market which *buys* it.

Our problem is to develop a placement and follow-up technique which will provide us with a medium for evaluating our product and which will also enable us to develop a sound method for *servicing* that product until it meets or exceeds the on-the-job specifications set up for it.

A practical approach to the problem may be made through the use of a job adjustment sheet similar to Figures 1 and 2, and an accompanying explanatory sheet similar to Figure 3.

Just as in any good teaching program, careful preparation for the job adjustment follow-up plan will cause both graduate and employer to see the practical value of the program, and the spirit of mutual co-operation which is so essential to the success of the undertaking is more likely to result.

The following outline may prove of value as a guide for preparing the students and the employers for the program:

Preparation of the Students

1. A functioning work habits and attitude program similar to that suggested by the writer on page 243 of the June, 1942, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine.
2. Specific teachers should be assigned the duty of teaching the objectives of the job adjustment program to the students:
   a) Discussions should be held concerning the items on the job adjustment sheet.
   b) Problems on the factors which make for successful and unsuccessful job adjustment should be prepared for class discussion.
   c) Specific information on the job successes and failures should be analyzed.
   d) The values of good co-operation between the school and industry should be discussed.
   e) Problems centered about the specific value and importance of the program to the graduate should be prepared.
3. Industrial personnel officers or supervisors should be invited to discuss the value of the program from an industrial viewpoint.

Preparation of the Employer

Those of us who have been working in the field of vocational education for any length of time know that industry thinks highly of our graduates. After the first placement is made in a business or industry, each succeeding placement is made more easily than the first. Our product has been our reputation and the uniform high quality of that product has become an accepted fact.

In areas where vocational schools are

JOB ADJUSTMENT SHEET

Name _____ Job classification _____

Rated by _____ Plant _____ Date _____

ACCURACY OF WORK		INITIATIVE	
1. Makes many errors		1. Doesn't exhibit any	
2. Is careless		2. Very little	
3. Is fairly accurate		3. Average	
4. Is careful		4. Offers many suggestions	
5. Is very accurate		5. Very original	
CARE OF WORKING SPACE		ATTENDANCE	
1. Very untidy		1. Off a great deal no valid reason	
2. Careless		2. Off occasionally no valid reason	
3. Just passable		3. Off occasionally with valid reason	
4. Keeps space clean		4. Seldom off	
5. Space very clean and orderly		5. Never tardy	
HANDLING OF TOOLS AND EQUIPMENT		ATTITUDE TOWARDS CO-WORKERS	
1. Rough		1. Does not get along	
2. Careless		2. Looks down on them	
3. Indifferent		3. Neutral	
4. Careful		4. Good	
5. Very careful		5. Well liked, very cooperative	
SPEED		ATTITUDE TOWARDS FOREMEN	
1. Very slow		1. Disrespectful	
2. Slow		2. Does not cooperate	
3. Ordinary		3. Average	
4. Fast		4. Cooperates	
5. Very fast		5. Very respectful, helpful	
USE OF WORKING TIME		OBSERVANCE OF SAFETY RULE	
1. Very wasteful		1. Disregards rules openly	
2. Loafs with others		2. Disregards when not watched	
3. Passable		3. Average	
4. Busy		4. Observes rules	
5. Very busy		5. Observes rules, has own rules too	
USE OF MATERIALS		ACCIDENT RECORD	
1. Wasteful		1. Many accidents thru carelessness	
2. Careless		2. Minor injuries thru carelessness	
3. Fair		3. Few minor injuries	
4. Good		4. Seldom injured	
5. Very careful		5. Never gets injured	
RESPONSIBILITY		PERSONAL APPEARANCE, CLEANLINESS	
1. Buck passer		1. Slovenly and dirty	
2. Evades responsibility		2. Untidy	
3. Passable		3. Fair	
4. Likes it		4. Neat and clean	
5. Seeks it and handles it well		5. Exceptionally pleasing	

Check only one item under each trait
Fill out other side

Guidance and Placement Department
Middlesex County Vocational School

Fig. 1. The job adjustment sheet by Albert E. Jochen

Please check the items in which you feel further training is necessary. In the blank spaces write in any other training needed.

INSTRUCTION	For Present Work	For Work In Immediate Future	For Future Advancement
Trade Mathematics			
Trade Science			
Sketching			
Layout			
Blueprint Reading			
Written English			
Oral English			
Industrial Safety			
Foreman Training			
Operation of Special Machines			
Use of Special Tools			

If any of the items are checked above, please make short specific statement below giving example of the particular instruction needed.

Fig. 2. Reverse side of the job adjustment sheet

February 5, 1946

X Y Z Corporation,
New Brunswick, N. J.

GENTLEMEN:

One of the controlling purposes of Middlesex County Vocational Schools is to send all-round, properly trained young men and women into business and industry. We are particularly concerned with their ability to be able to make satisfactory adjustments to the job and to the personnel with whom they must work.

This will introduce Robert F. Stonacre, a graduate of our Industrial Electrical department. This graduate has received approximately 1620 clock hours of carefully planned training in practical industrial electrical problems; approximately 810 clock hours of related training in trade mathematics, trade science, blueprint reading and related drawing; and approximately 810 clock hours of general training in industrial English, social studies, industrial history, industrial safety and hygiene, library, and physical education.

We realize that no matter how practical and comprehensive our training may be in the school shop and classroom, there are many things which our graduates must learn on the job and through attendance in advanced classes in evening school.

In order that we may determine the effectiveness of the instruction we have already given and in order that we may assist our graduates in the selection of evening instruction that will improve them, we ask your co-operation and assistance in the filling out of job adjustment follow-up sheets similar to the one attached.

We thank you for your very kind co-operation in our effort to bring about a more satisfactory adjustment of our graduate to your job situation, and we invite and welcome your constructive criticism of our efforts.

Very truly yours,
Guidance and Personnel Department

Fig. 3. The résumé sheet.

located, business and industry turn to the vocational schools for assistance in their training problems and rarely do they find the vocational schools unable to give real practical assistance. When you propose a job adjustment follow-up plan the purpose of which is to assist the vocational school graduate in making a better adjustment to the job and the personnel with whom he works, industry will co-operate.

The following suggestions may prove helpful when initiating the program:

1. Personal placement of the graduate in the job situation.
2. Introduction of the graduate and his training background to the employer. Utilize the résumé sheet, Figure 3, during the conference. Stress the following factors:
   a) School knows and graduate knows that he is not a finished worker.
   b) School is very definitely interested in the graduate and wants to know whether he is satisfactory or unsatisfactory and why.
   c) After a reasonable work period, two or three months, the school would appreciate the co-operation of the graduate's immediate superior in filling out the job adjustment sheet.
   d) Go over job adjustment follow-up plan very carefully and leave samples of the sheets so that employer may study them and offer constructive suggestions and criticism.
   e) Check the graduate's job adjustment every three months during the first work year and every six

months thereafter for at least two years.

3. Benefits of job adjustment follow-up program to the employer:
   a) School assists and works with industry and business in adjusting employee to total job situation.
   b) School provides upgrading or specific training necessary to make a better job adjustment.
   c) Expensive turnover should be materially cut through co-operative job adjustment follow-up program.
   d) School having had a longer and more personal contact with the employee may be able to provide the extra spark so often necessary for successful job adjustment.

Conclusions

Although the writer is aware of the fact that a mere job adjustment program no matter how carefully worked out will not solve all our placement difficulties or provide us with an all inclusive evaluation of our curricula, yet time and effort spent in this direction should produce the following desirable results:

1. A personalized placement and follow-up service which graduates and industry will recognize as of personal value.
2. A spirit of good will with the graduate and with industry.
3. The kind of industrial and business contacts and relationships which are so important to the success of any vocational program.
4. A reliable source of specific information which may be used to evaluate the curricula.
5. The placement director and those assisting him are enabled to get a continuous firsthand viewpoint of working conditions and industrial methods under which the graduates work.
6. A source of industrial trends which may influence curricula changes or may provide initiative for the institution of new courses.
7. A wealth of data which should be of value in the development of more accurate selection and guidance techniques.
8. A good source of students for evening and extension programs of instruction.

Perfect crystals of pure iron, 100 times stronger than any known metallic crystal and resistant to rust, have been developed at General Electric Company research laboratory, Schenectady, N. Y. Crystals are said to represent first achievement of metals that are as strong as theory predicts they should be. — *Industrial Research Newsletter.*

SILK SCREEN WRAPPING PAPER

LLOYD WHYDOTSKI
Chairman, Graphic Arts Department
The Stout Institute
Menomonie, Wis.
and
OLIVER J. AGERLIE
Graphic Arts Instructor
High School
Richfield, Minn.

The wrapping paper described and illustrated in this article can be used as an easy, inexpensive project for silk-screen reproduction in any graphic-arts class on the senior high school level. The stencil can be cut, adhered to the screen, and printed in approximately five one-hour class periods.

The project has unusual practical value, for in any student's home there are many uses of special wrapping paper. Occasions for special wrapping paper include Christmas, Valentine's Day, weddings, birthdays, and other celebrations. Making silk screen stenciled wrapping paper involves the fundamental operations used in the average silk screen job.

Materials Needed To Make Frame

Medium mesh silk
Four wood bars (size to be determined by the size of the design)
Tacks or staples
Two small hinges
Screws to fit hinges
Flat board for frame

Other Materials Needed

Variety of colors of screen process paints (recommend Naz-Dar 5500 Series process paint)
Squeegee (large enough to fit width of design)
Adhering liquid
Film stencil material (Profilm, Nu-film, or other suitable material)
Reducing varnish (thinner)
Masking tape
Cleaning solution (usually gasoline)
Paper stock
Cotton
Clean dry rags
Backing lacquer

Students should follow carefully these steps:

1. *Select or design the pattern.* See Figure 1. The design should be suitable for the occasion (Easter, Fourth of July, etc.).

2. *Make a layout of the design.* Make a full-size, accurate layout of the selected design. Use colored pencils to represent the final colors desired in the wrapping paper.

3. *Cut the film stencil material.* See list of materials for types. Place a piece of film (gloss side up), large enough to cover the first color, over the design. Use masking tape to hold the film firmly in place on the layout. Cut the top layer of film, following the outline of the color, and peel away the part of the film to be printed. Other colors of the design are placed, cut, and peeled in the same manner.

4. *Secure the screen to the frame.* Make a frame, using four wood bars joined together at the corners to form an open rectangle. Corners may be dovetailed together for a firm fit. To assure rigidity, add metal angle plates. Attach the screen with tacks or staples. To assure a snug fit, stretch and hold the screen tight while

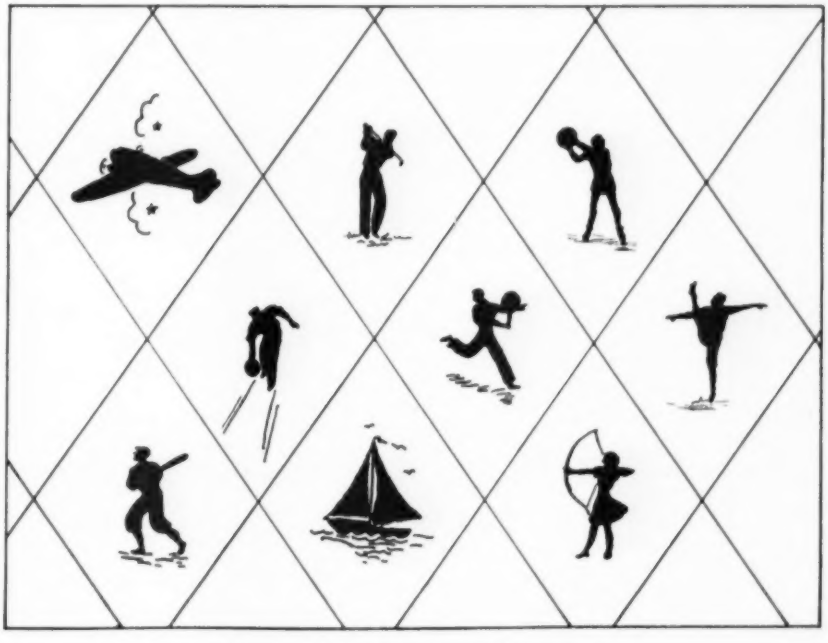


Fig. 1. Silk screen wrapping paper

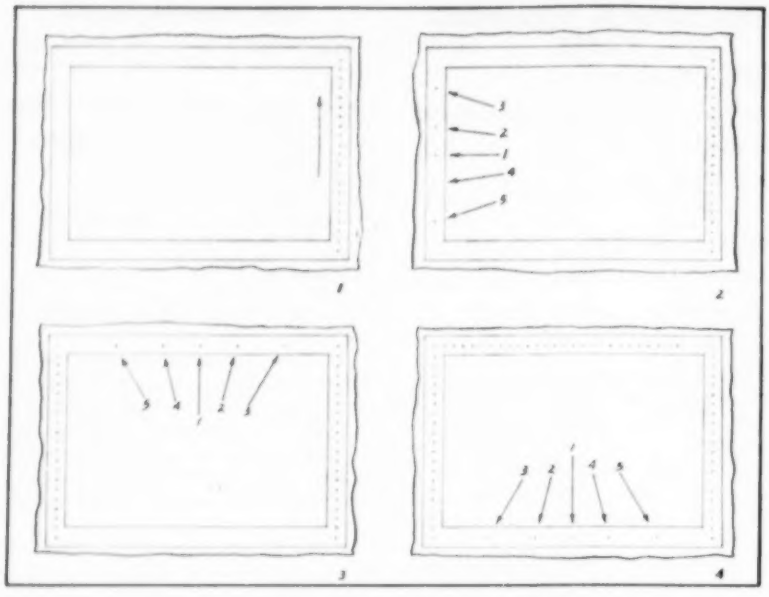


Fig. 2. Secure the screen to the frame

securing it to the frame. See Figure 2. Check the screen for tightness.

Fasten the screen frame to a flat board, open side up, using hinges.

5. *Adhere the first film to the screen.* Place the film, gloss side up, on the frame board. Center the film in the frame, allowing the frame to rest flat on the film. Saturate a small cloth with adhering liquid. Then, with a dry rag, rub a square inch of one corner of the film through the screen. CAUTION: Do not continue to rub. Instead, wait ten seconds and then rub vigorously with the dry cloth.

Repeat this process across the entire design; then drop down an inch and work across again until the film is completely adhered to the screen. Remove the film backing.

Using masking tape, cover the nonimage portions of the screen. Apply backing lacquer to the portions of the screen which is not part of the design or which is covered by the film and masking tape. Allow time for drying.

6. *Cut the paper stock.* Cut the paper stock to desired size, choosing a lightweight, flexible paper of thirteen or sixteen pound stock. Allow for spoilage and register adjustments. Also cut paper guides of thin cardboard stock for use as guides.

7. *Reproduce the first color.* Select the first color to be reproduced, usually the lightest color of the pattern. Remove an anticipated amount of paint from the paint can and place it in a container about the size of a pound coffee can. Add thinner to the paint until the paint is slightly more moist than "tooth paste" consistency.

8. *Set the paper guides.* Place the paper guides, using masking tape, to the back and left of the design as the design would print on the frame. Have the hinges of the frame away from the operator.

9. *Produce the first copy.* Place a first sheet of paper stock in position on the frame board, spread a liberal amount of paint across the far edge of the screen and with a squeegee wide enough to cover the design, draw the paint across the design. Remove the completed sheet and make final guide adjustments. Finish printing all desired copies of first color. NOTE: Do not place freshly printed copies on top of one another.

10. *Clean the equipment.* Scrape the first-color paint out of the frame and clean the screen thoroughly with water (if the paint is not water soluble, careful use of gasoline is recommended). Gently remove the masking tape from the mesh. Use lacquer thinner on a cotton pad to dissolve and remove the backing lacquer and film from the mesh.

11. *Allow the mesh and the frame time to dry.* Dried paint remaining in the mesh after the drying process may be removed by the use of a fine needle. However, be careful to prevent weakening of the mesh fibers by splitting them with the needle.

12. *Reproduce the remaining colors of the pattern.* Repeat the adhering and the painting processes for the additional colors, working from light to dark colors. Careful register of all the colors will insure an excellent silk screen job.

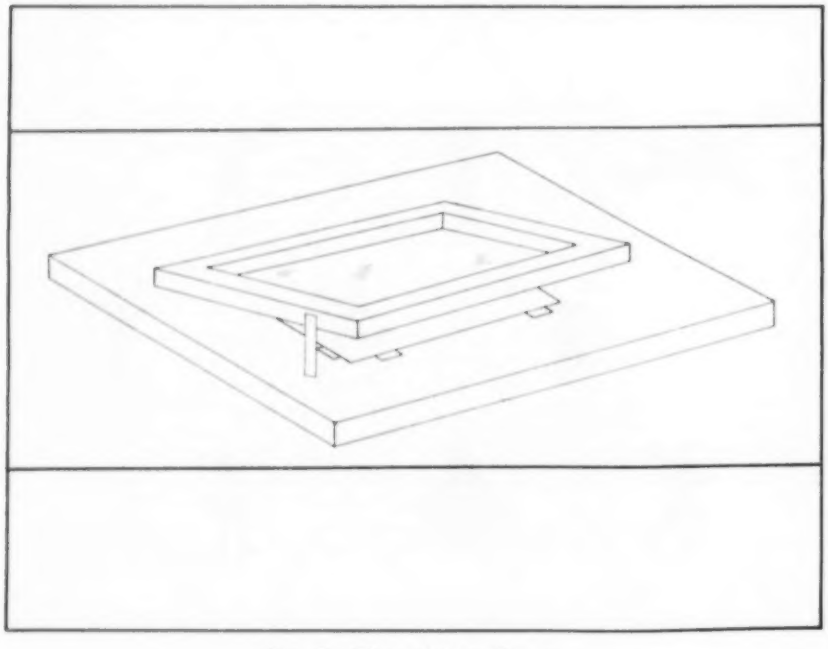


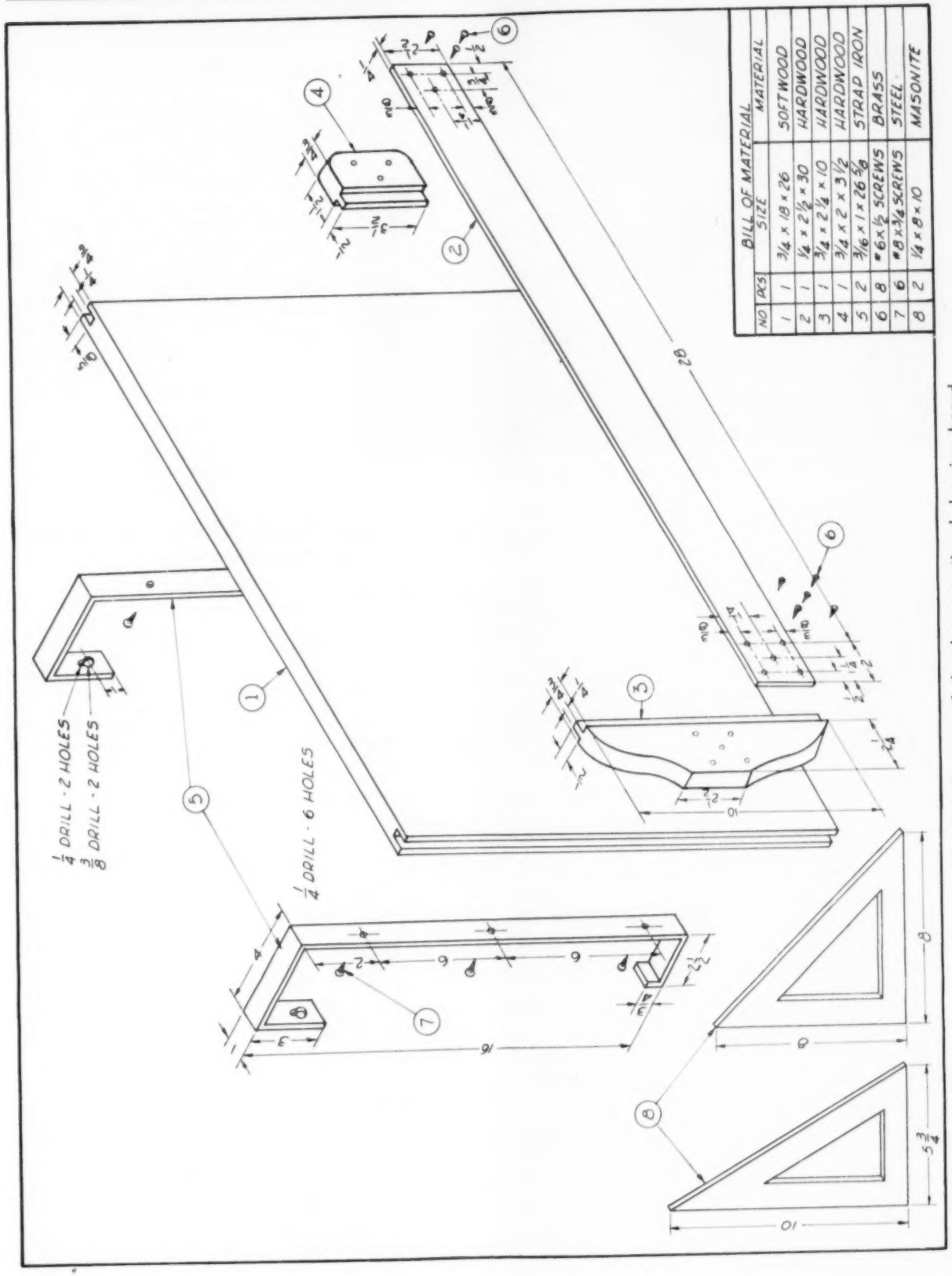
Fig. 3. The printing frame

DEMONSTRATIONAL DRAWING BOARD

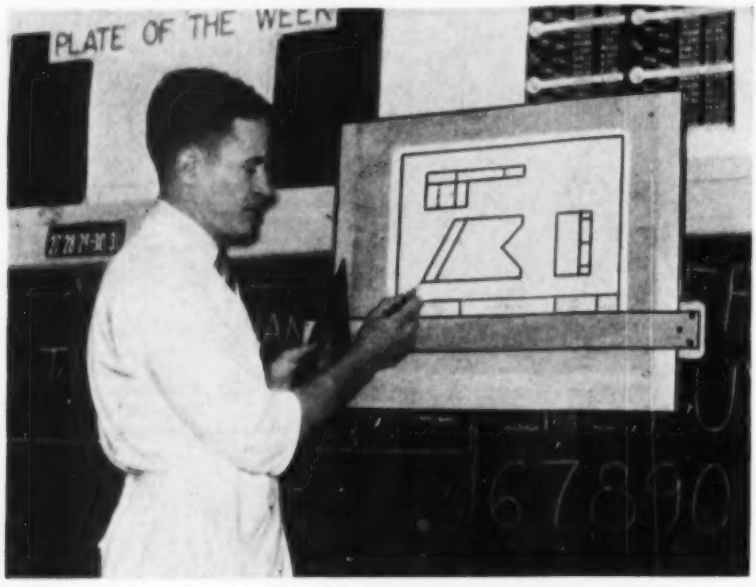
JAMES T. LONG
Industrial Arts Teacher
Long Beach, Calif.

The drawing board shown in this article is a teaching device that can be used to good advantage in any room of the school. With our present crowded conditions the industrial-arts teacher at the beginning of the school semester may be unduly surprised to find that he has been assigned to a room quite inadequate for industrial-arts drawing (mechanical drawing).

To ease this situation there are many aids which can be used. Although a given aid may work well for one teacher it may not for another; therefore, in presenting this demonstrational drawing board the


BILL OF MATERIAL
NO | PCS | SIZE | MATERIAL
1 | 1 | 3/4 x 18 x 26 | SOFTWOOD
2 | 1 | 1/4 x 2 1/2 x 30 | HARDWOOD
3 | 1 | 3/4 x 2 1/2 x 10 | HARDWOOD
4 | 1 | 3/4 x 2 x 3 1/2 | HARDWOOD
5 | 2 | 3/16 x 1 x 26 3/8 | STRAP IRON
6 | 8 | #6 x 1/2 SCREWS | BRASS
7 | 6 | #8 x 3/8 SCREWS | STEEL
8 | 2 | 1/4 x 8 x 10 | MASONITE
1/4 DRILL - 2 HOLES
3/8 DRILL - 2 HOLES
1/4 DRILL - 6 HOLES

Detailed drawing of the demonstrational drawing board



A demonstrational drawing board designed by James T. Long

author hopes that it may help someone as it has helped him.

Seeing is believing — this is as true with industrial-arts students as it is with others. To have an actual drawing board and the necessary instruments in a position where each student may clearly see what the teacher is doing will be more likely to present the subject so that the student may see more clearly that the teacher's way is correct. When using this drawing board, it is best to use a very soft pencil or a grease pencil in order that the students in the back of the room can clearly see what is being presented. The elevation of the drawing board from the floor will depend on the teacher and the size of the room.

The many uses for the drawing board will depend on the individual groups. The author used it in many demonstrations — from showing the beginning students how to place a sheet of paper correctly on a drawing board to the more detailed work in perspective.

This drawing board may be made from an old regulation drawing board. Likewise with the T square, with a few added pieces. A regular triangle could be used but it has been found that a colored triangle or a special set made of a dark material like fiberboard better serves the purpose.

Natural gas is being put back into the ground where it is needed instead of where it happened to be found. About one-third of the supply of natural gas comes from oil wells. It is a seasonal commodity, needed mainly for residential heating and at peak demand in winter. Storage of natural gas near consuming areas is made underground in the type of reservoir that nature used. Although storage like this has required an investment of some $250,000,000 by the industry, it will result in a bigger share of the nation's gas supply for householders. — *Petroleum Newsnotes.*

The oil industry employs more than 17,000 college-trained engineers and scientists. — *Petroleum Newsnotes.*

FALSE TOOTH PUSH BLOCK

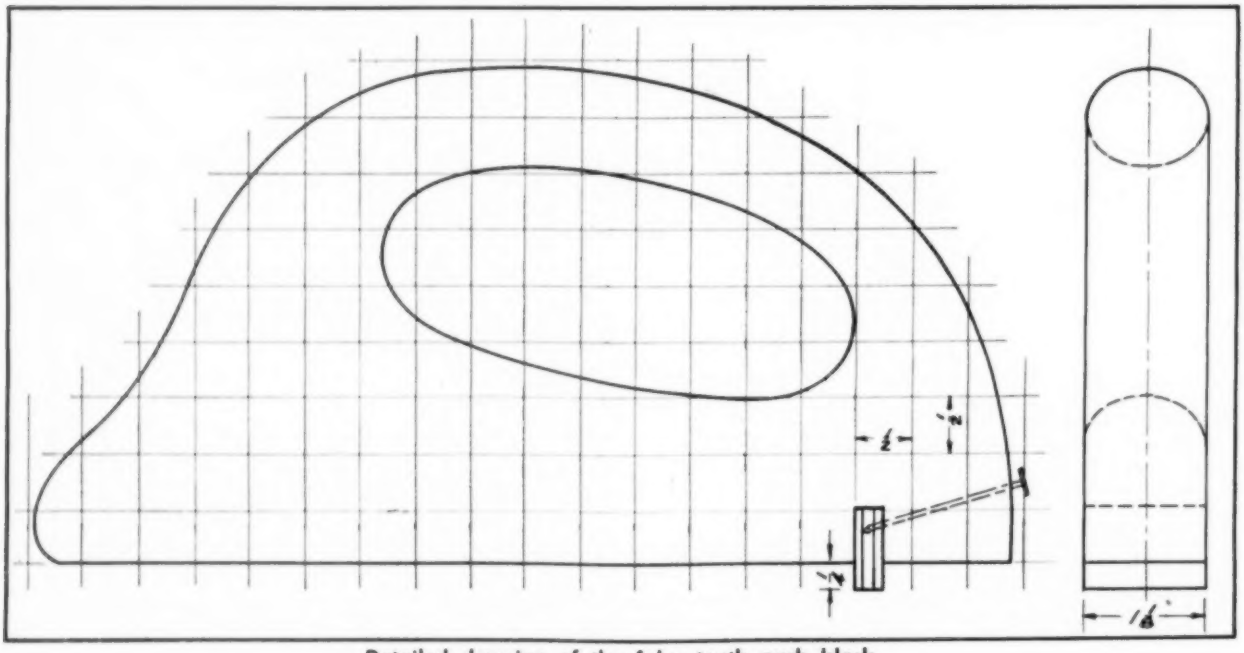
NORMAN BROOKS

Penn High School

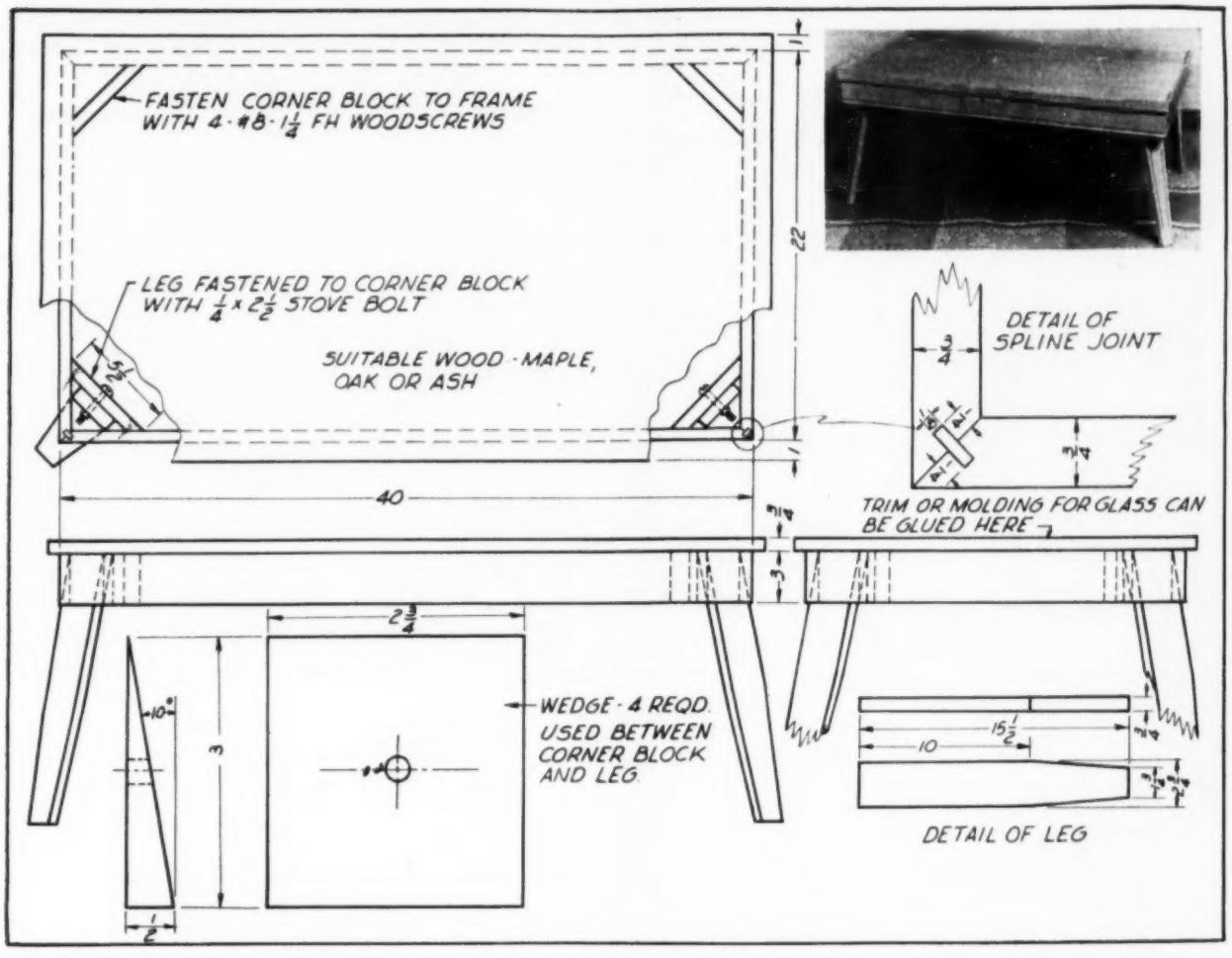
Greenville, Pa.

A removable tooth made from ¼-in. plywood and fastened in the gained joint with a wire nail to hold the tooth in place will save much time when an error cuts the lug off the push block.

See that the grain in the outside plies runs up and down to give necessary strength to the tooth.



Detailed drawing of the false tooth push block


FASTEN CORNER BLOCK TO FRAME WITH 4-#8-1¼ FH WOODSCREWS
LEG FASTENED TO CORNER BLOCK WITH ¼ x 2½ STOVE BOLT
SUITABLE WOOD - MAPLE, OAK OR ASH
22
40
DETAIL OF SPLINE JOINT
TRIM OR MOLDING FOR GLASS CAN BE GLUED HERE
2¾
WEDGE - 4 REQD. USED BETWEEN CORNER BLOCK AND LEG
10°
3
½
15½
10
DETAIL OF LEG

Modern blond coffee table by Louis Barocci, Cudahy High School, Cudahy, Wis.

SHOPKEEPING PERSONNEL BOARD

LEONARD W. GLISMANN
Director, Industrial Arts Education
Salt Lake City, Utah

CARL WALLIS
Ben Lomond High School
Ogden, Utah

In every industrial-arts shop there is a crying need for a system of "shopkeeping." This is accomplished by adopting a personnel organization board to systematically assign the cleanup responsibilities.

An attractive and intriguing board will do much to obtain the interest and cooperation of a student. A wheel with letters and numbers always catches the eye.

The personnel board is made as follows:

On a piece of plywood ½ by 32 by 36 in., a wheel of plywood ¼ by 18 in. in diameter is fastened above center. The 18-in. wheel is divided into 10 equal parts and cutout letters are fastened in the divisions to designate the assignments.

On the 18-in. wheel a rotating wheel 12 in. in diameter is painted and numbered from 1 to 20. On each side of the board are mounted 3 by 5-in. cards, lettered to correspond with the letters on the large wheel. Each card has a statement regarding the duties of that letter.

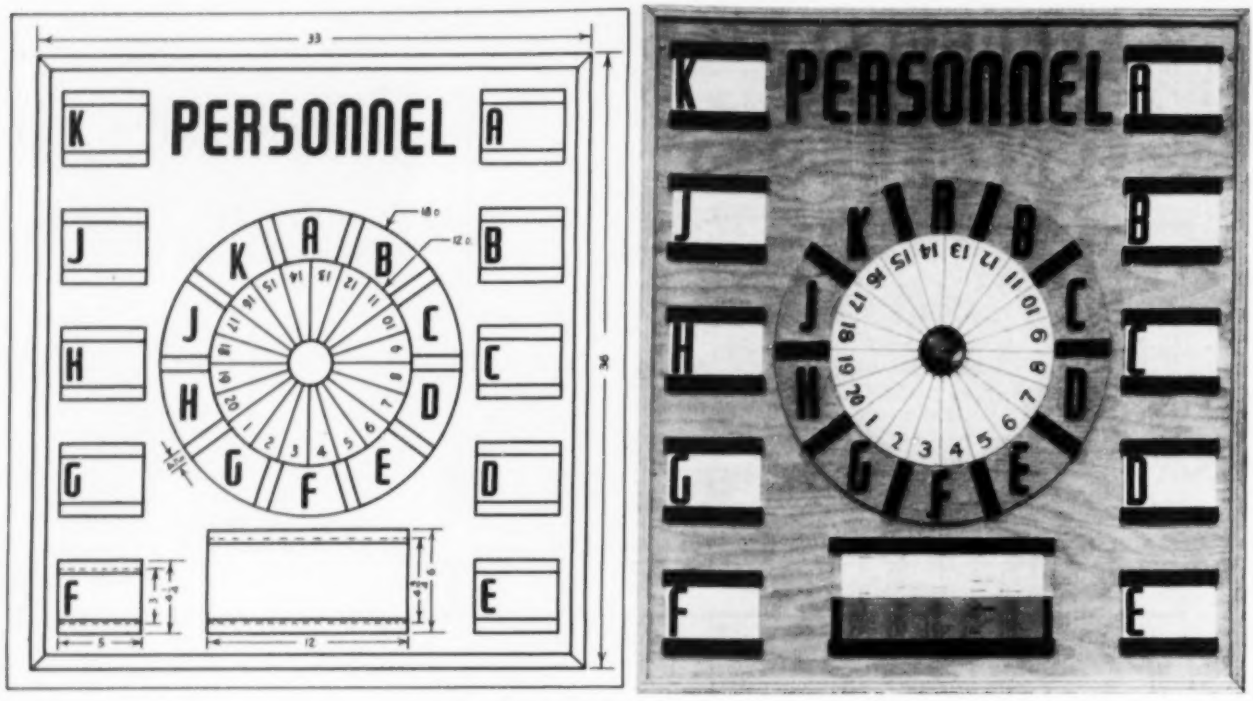
On the 5 by 11-in. card mounted just below the wheel are listed the students by classes. Each class is divided into odd and even numbered students.

Between each letter division are two numbers, odd and even. The odd numbers assume duties for a mutually agreed period of time, for example one week, then the even numbers follow the next week. This gives each student one week of duty and one week of *stand-by duty*. After each odd and even number has had a duty term the wheel is rotated two complete numbers, putting the two numbers into a new letter division.

When classes exceed 20 in number; number 21 becomes 2nd number 1; 22 becomes 2nd number 2, and so on. If all classes are smaller than 20, use the smallest class as the guide to making the wheel divisions. If only one or two classes are smaller than 20 in number it will necessitate some students assuming two numbers and two jobs.

The following suggestive duties are a representation of those used successfully in two general shops and one unit shop in Ogden, Utah.

A. Make sure all workers perform duties properly — take charge during a temporary absence of teacher — appoint a substitute for an absent worker, if alternate is also absent. Give signal for cleanup.
B. Perform the duties of "A" when "A" workers are all absent — check key panel — check all drawers at the end of period, make sure they are locked — have all workbenches and areas cleaned off.
C. Supervise all reference materials and books in the planning area — see that all instruction sheets and patterns are properly put away and that the area is neatly arranged at the end of the period.
D. Clean off all power machines and



The shopkeeping personnel board

their general area that were used during the period. Do this carefully and neatly. Report any equipment found out of order.

E. Check all tool cabinets on the east wall carefully when opening and report any missing tools — see that all tools are properly returned and in good condition — immediately after cleanup bell rings — know their position.

F. Check all tool cabinets on the west wall carefully when opening and report any missing tools — see that all tools are properly returned and in good condition — immediately after cleanup bell rings.

G. At the end of period clean up finish table — tighten all bottle lids and return to proper places — take care of brushes properly — put rags in proper container.

H. Clean sink at end of the period — see that table and stove adjoining sink are left orderly — practice good housekeeping.

J. Clean off soldering table and arrange equipment orderly — tighten lids on the pickle and water jars and flux bottle.

K. Regulate lights and ventilation when necessary — take charge during fire drill — assist the instructor with first aid — see that all safety practices are used at all times.

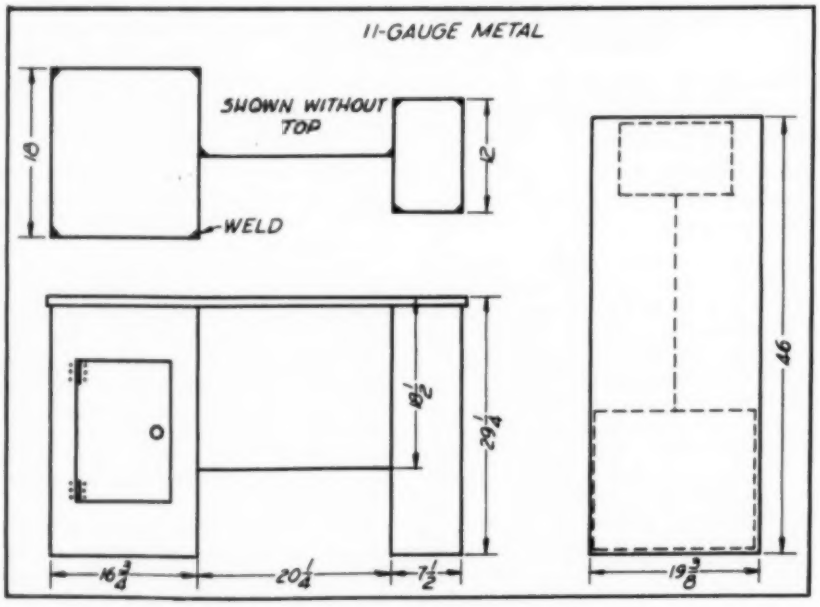
When odd numbers have the duty a piece of clear plastic is over their number. When odd numbers are off duty a piece of colored transparent plastic is exchanged for the clear piece. Even numbers follow the same procedure.

When a person is absent it is agreed that the companion number on the wheel position assumes his duties. If both are absent the *A* worker assigns a student to the job as outlined for the *A* duty.

As can be seen, this personnel board is quite adaptable to change and sharply defines responsibility, covers the necessary jobs, and rotates the personnel, resulting in good *shopkeeping*.

Total footage of oil wells drilled in 1953 was close to 200,000,000 feet. This figure represents a 10 per cent increase over 1952 totals. If all this drilling had taken place in one spot, the hole would have gone through the earth almost 5 times. — *Petroleum Newsnotes.*

Seventeen per cent of the total power consumed by this nation in 1953 was used to propel motor vehicles. —*Petroleum Newsnotes.*

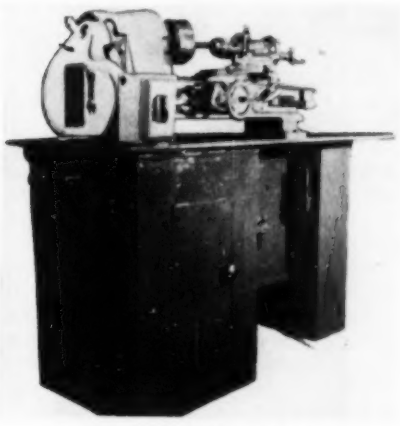


Details of the lathe bench by George W. Deffendahl

A MODERN LATHE BENCH

GEORGE W. DEFFENDAHL
Central High School
Evansville, Ind.

This article and the accompanying illustrations show a modern lathe bench which we designed and made in our metal shop classes. This bench has improved the appearance of our shop and assists in keeping our shop clean.



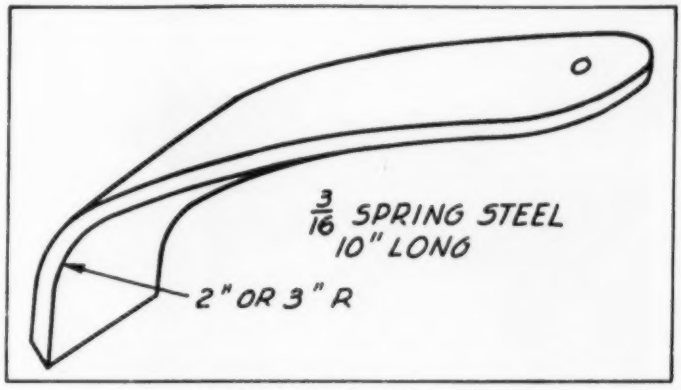
A modern lathe bench

To bring oil to Americans in 1953, the oil industry drilled approximately one mile of hole **every 14 minutes.** — *Petroleum Newsnotes.*

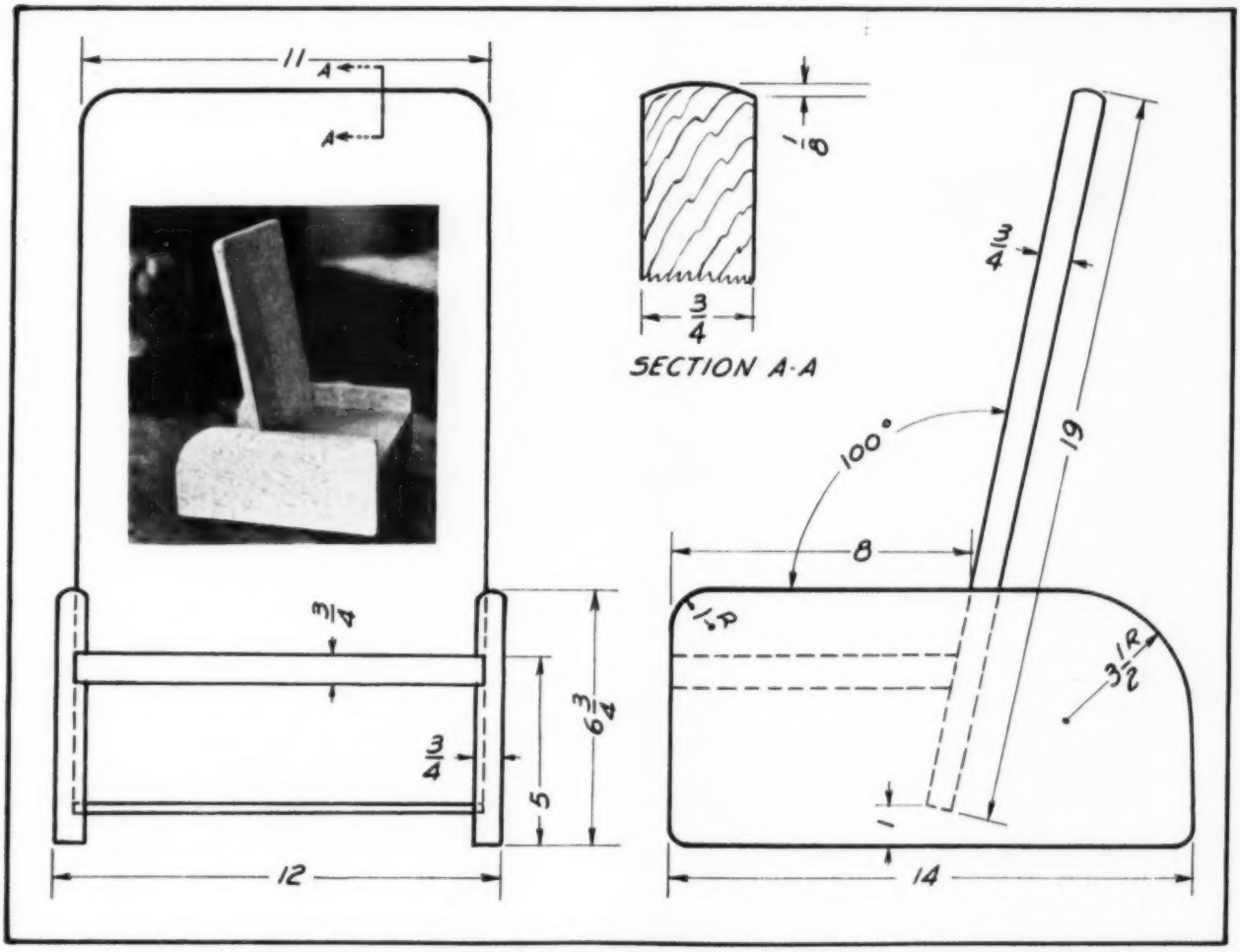
HOOK SCRAPER FOR THE AUTO SHOP

HOWARD ATAMIAN
Woodshop Instructor
Hilmar Unified Schools
Hilmar, Merced County, Calif.

The hook scrapers in our shop were wearing out more from being ground than from actual use, so we decided to make



Hook scraper for shop use



Kiddy seat by Leonard Haskell, Shop Instructor, City Schools, Baker, Mont.

our own. We cut the leaf of a car spring about 10 in. long, forged it, hardened and tempered it, ground an edge, cut a hole with a cutting torch, and in about 30 minutes had a scraper which would do a good job as a scraper.

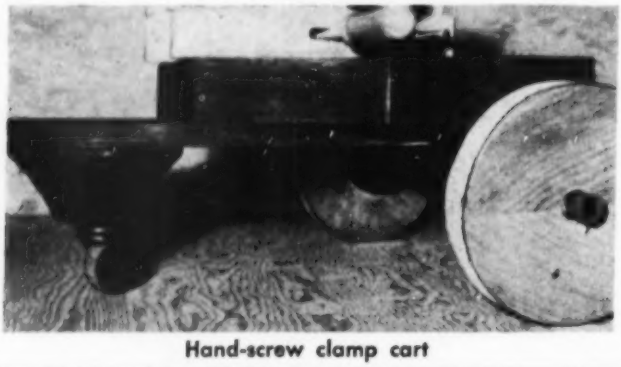
In addition, this scraper very seldom wears out, never has broken handles, and needs no new blades. When the hook is ground down, all you have to do is to forge another hook, grind a bevel, and you will have a scraper as good as new.

Try to forge the hook to a 2- or 3-in. radius as this will keep the handle of the scraper high enough above the wood to prevent skinned knuckles.

CART FOR STORING HAND-SCREW CLAMPS

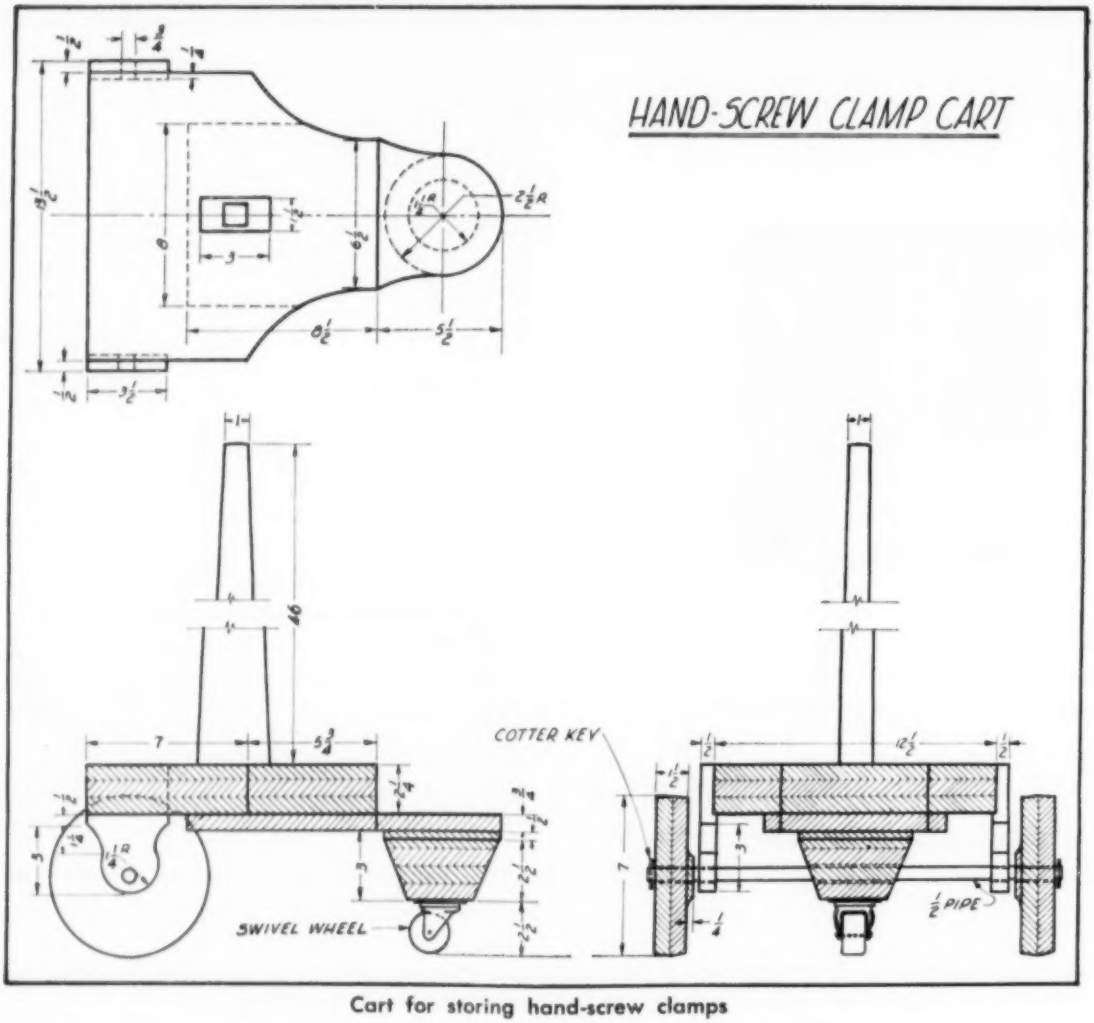
KEITH H. JENNER
Woodworking Department
Senior High School
Fort Dodge, Iowa

This center-post cart for storing hand-screw clamps, or similar items, can be made almost entirely from odd scraps of ¾-in. plywood. Three layers of ¾-in. ply



Hand-screw clamp cart

Cart for hand screws

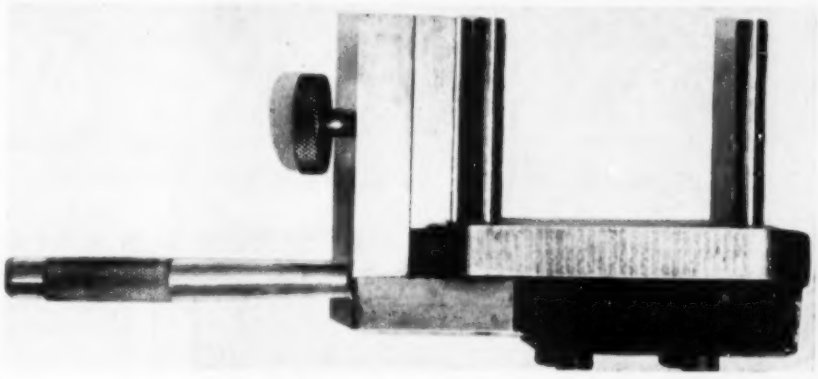


Cart for storing hand-screw clamps

are glued face to face to form the main base, which is 13¾ in. by 12¾ in. One piece of ¾-in. ply 8 by 11 in. is screwed to the bottom of the main base and allowed to extend forward to accommodate the swivel wheel. The two rear wheels are made by gluing two ¾-in. plywood scraps together and cutting them out on the band saw. The wheel blanks are then trued up on the lathe leaving a slightly high rim point in the middle of the wheel width. A ½-in. pipe is used for the axle. The center post is 52 in. long and tapers from 1½ in. at the top to 4 in. at the base. The last 2½ in. is turned to a 1½-in. diameter so as to be doweled into the main base. A ⅜-in. by 4-in. lag screw holds the shaft securely in the base.

This cart moves easily about the shop room, making it easy to sweep and keep the room orderly. For rapid transport the main shaft can be pulled toward the operator and thus shift all the load onto the two rear wheels allowing it to be pushed like a two-wheeled cart.

"Two out of three children who fail reading in the first grade have vision problems." — *Dr. Lois B. Bing*, Cleveland optometrist.



Bending jig for ash tray

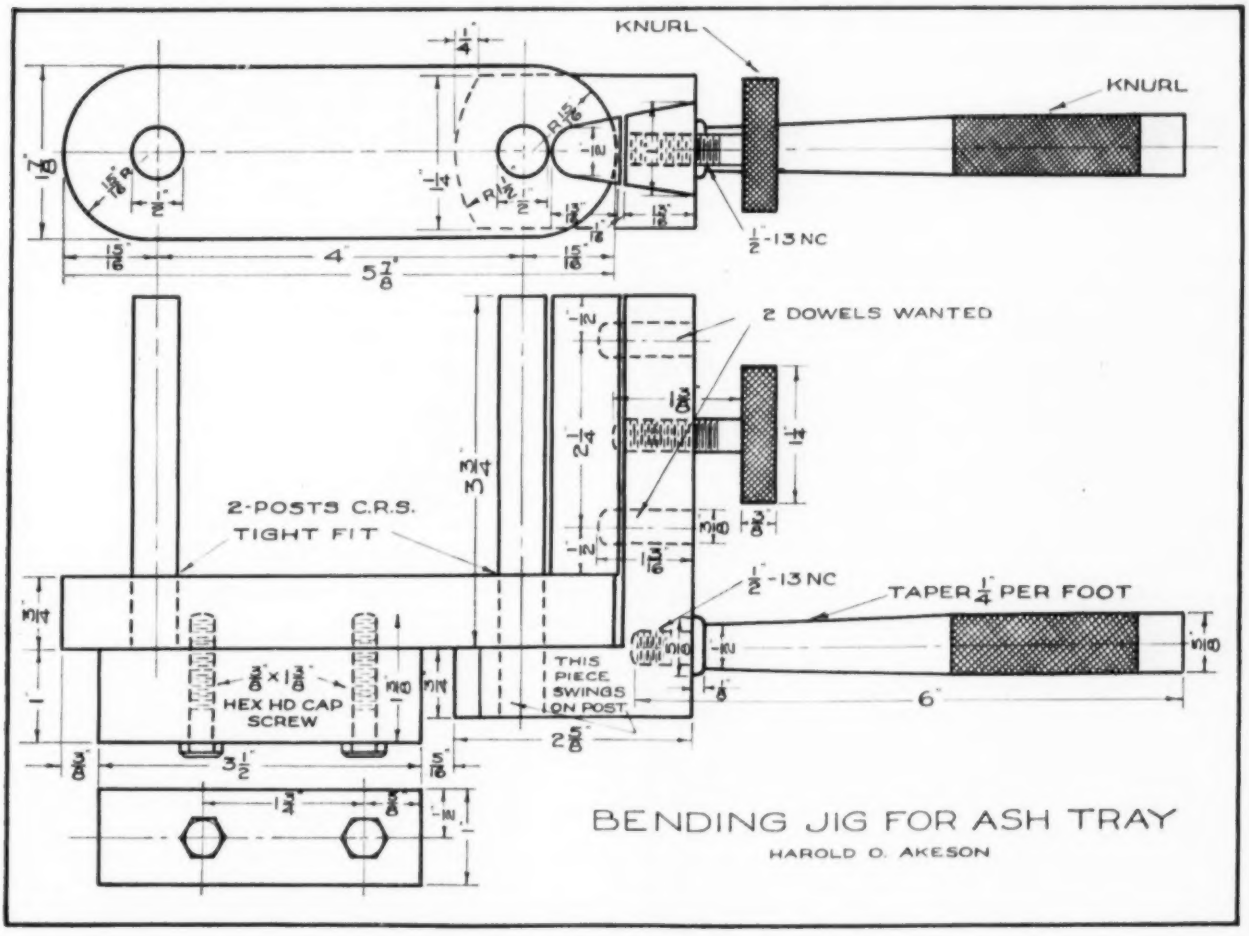
ASH TRAY AND BENDING JIG

HAROLD O. AKESON
High School
East Orange, N. J.

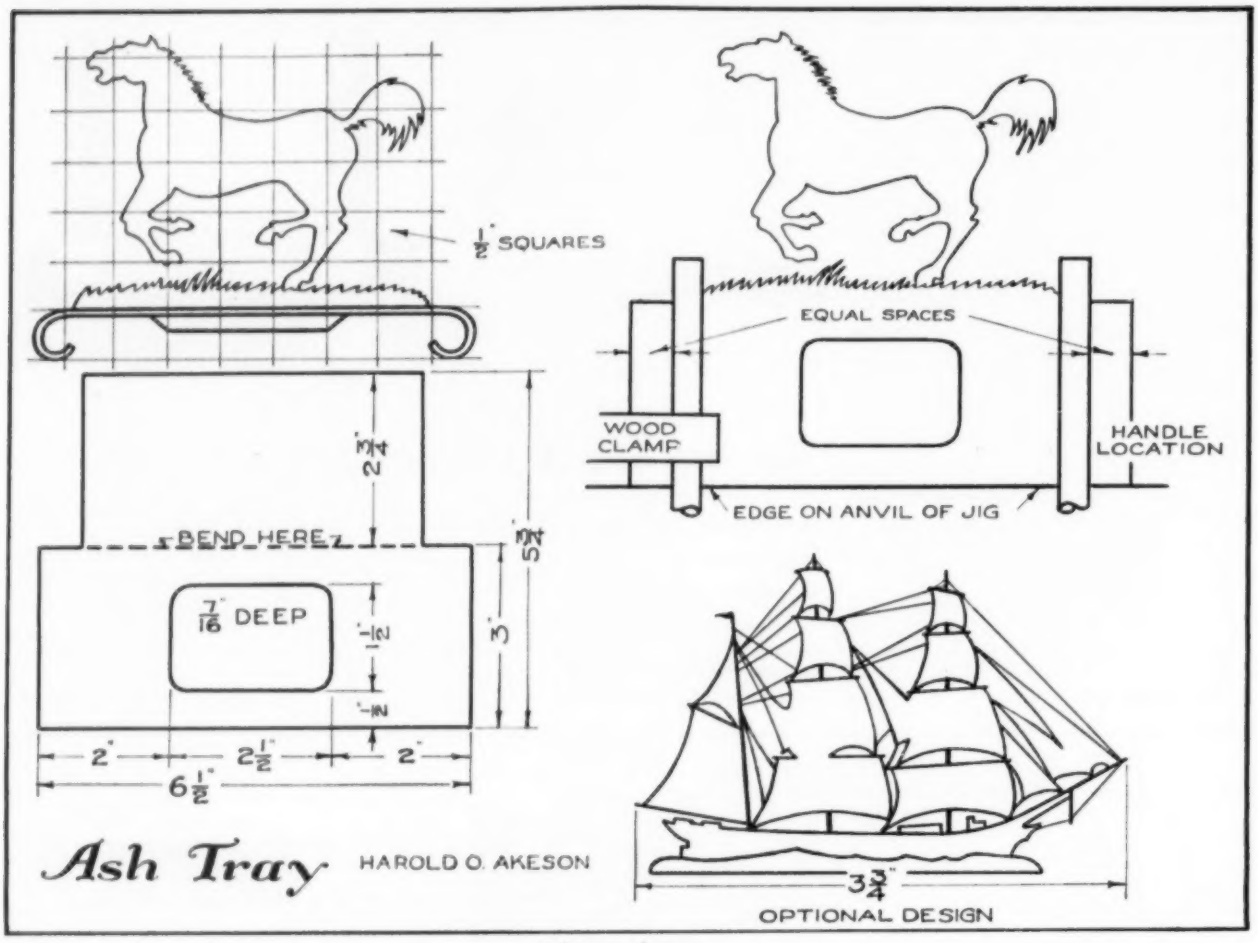
An ash tray that has a personal feature is something that is always highly valued. It may represent a sport, a hobby, or something else individually distinctive. Whatever the subject, the ash tray thus described lends itself very readily to a complicated, difficult design just as effectively as to a simple pattern.

To make the ash tray, lay out pattern of tray on a piece of 18-gauge soft copper, 6½ by 5¾ in. After cutting out the general shape with tinners' shears, ball-peen the piece all over except the space for the design.

Anneal the copper after hammering.



Bending jig for ash tray



Ash-tray designs

This softens the metal preparatory to shaping it. A maple block is necessary for this operation with the depressed part slightly deeper than ¼ in. to allow for the thickness of the metal. As soon as the metal again becomes hard, by pounding, anneal it, or it will crack. This annealing of the work should be very carefully observed. Make corners as sharp as possible without cracking them.

After the piece has been formed, center, square, and file all edges smooth.

Lay out a full sized pattern of design from illustration. Then drill holes in the waste parts for inserting jewelers' saw blade. Cut out the object with jewelers' saw, following lines closely for accurate results. File all edges smooth.

Before bending the feet of the ash tray anneal the metal. After the piece is annealed set it into the bending jig, between the bars, with the front outward. It should be placed so that the margins between the posts and the edge of metal are the same. Fasten the end, opposite the bending jig handle, with a wood clamp which will give the other side with the handle a chance to be adjusted and then turned from a right angle position to shape the half turn curve which makes the foot. Practice with some scrap copper, the same length as the base of ash tray, would help prevent a mistake or spoilage on the tray itself. Interchange the location of the project and operation method so that the handle makes the return swing from the back to the front of the tray thus making the curve for the other foot. When the curves on each side, making the feet, have been turned it will make a smooth, tubular job.

Clean work in a dilute solution of nitric acid. Polish with very fine steel wool, antique and lacquer.

Bending Jig for Ash Tray

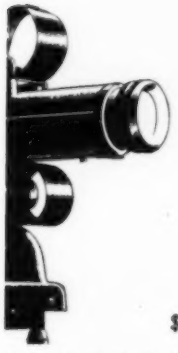
This bending jig is a useful device in the shaping of the curve or scroll for the ash tray foot. It also made a good project for the mechanical drawing department and machine shop in the design and use of jigs.

In building such a project, as a bending jig, the student will learn bench-work operations such as laying out, the use of rules, dividers, and how to tap. His lathe work experience will include such operations as face-off, center, rough turn, finish turn, shoulder turn, drill and tap in chuck, boring, reaming, threading, and knurling. On the cylinder grinder, he will learn rough and finish straight grinding and rough and finish taper grinding. There will also be milling machine practice. On the shaper he will have experience facing and squaring up stock. He will also receive experience in finish drilling and in the use of tap drills.

It is not advisable to build many of these jigs but as a special job that is to be used for standard production purposes, it is necessary. It is also a project that would give the student an insight of what to expect in industry as jigs and fixtures are devices that are very necessary and useful in the machine tool occupation.

Rich in atomic mineral resources, Brazil has initiated extensive program of nuclear investigation and development to learn how it can harness atomic energy for industrial purposes. National Research Council of Brazil recently acquired 6.5 million electron volt synchrocyclotron for nuclear research and as training aid for Brazilian technologists. Instrument was built at University of Chicago. — *Industrial Research Newsletter.*

STANLEY SHOP TALK



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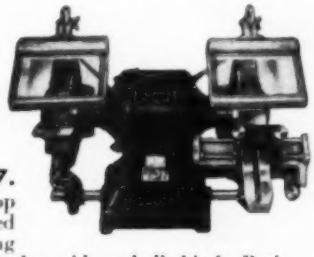

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PERSONAL NEWS

(Continued from page 8A)

He was born at Sherman City, Mich., April 9, 1893. From 1899 to 1915 his home was in Muskegon, a manufacturing and port city on Lake Michigan.

Young Williams started early on his industrial experience. Ten hours was a day, 55 to 59 hours a work week, and boys were paid 50 to 75 cents a day.

When he was 14, and there seemed no possibility of getting enough money to finish high school, he went to work on a full-time basis, expecting to learn a trade.

At 16 he returned to public school with the sole ambition of becoming a teacher of manual training. This meant six years of schooling ahead of him. In the last half of his junior year he had to drop out and work. He always managed to have Saturday, holiday, and summer jobs until the depression of 1914–15, when it was necessary to get out and pick up anything he could find, such as wood chopping, carpentry, and cabinetwork.

He was graduated from Muskegon High in 1913 and Hackley Normal School in 1915. His first job was in the high school at Elkins, W. Va., where he undertook to set up the school's first manual training courses. In two years he had his own students at work and had set up night school classes for railroad shop workers of the town. In 1917 he moved to McKeesport, Pa., where, in a few months he was appointed acting supervisor, with a manual training staff of several teachers in four schools. Soon he was teaching school five days a week and working two 13-hour night shifts in a steel mill, as machinist and millwright. The night work paid his board and room and gave him an insight into the problems of steel manufacturing.

Ed Williams always believed that the man who taught vocational subjects needed a solid background of experience in the working end of the business he was attempting to teach. His own experience included work as a machine operator and millwright in various Muskegon factories, as a draftsman, carpenter, sawmill worker, printer, and machinist.

In 1919, shortly after the passage of the Smith-Hughes Act, Ed Williams started the first vocational drafting class in Pennsylvania at McKeesport. In 1922 he went to Braddock, Pa., as director of vocational education, and built a vocational program in the schools to serve the industries of the Pittsburgh area. He remained in Braddock until he came to Texas in 1925.

E. L. Williams

Ed Williams' undergraduate college training was acquired on a hit-and-run basis. Since his graduation from Hackley Normal, which was not recognized in academic circles, he had taken Saturday, night, and summer work at any college which happened to be handy. In the summer of 1917 he had attended the University of Wisconsin, in the summers of 1922, 1923, and 1925 he had enrolled at Pennsylvania State College. Almost continuously from 1920 to 1925 he had taken evening courses and extension work at the University of Pittsburgh and Carnegie Institute of Technology. Finally, in 1925, he received his bachelor's degree at the University of Pittsburgh. Five years later, having sandwiched graduate courses into a busy schedule as a college department head, he received his M.S. degree from the A. and M. College of Texas.

In the meantime he pioneered industrial vocational teaching in Michigan and Pennsylvania before coming to Texas in 1925 to head the A. and M. College of Texas' department of industrial education. In 1940 the Industrial Extension Service was added to the department, with Williams as its head. In 1848 the extension work had grown until it was organized as the Texas Engineering Extension Service, under his leadership.

He also developed many new and successful approaches to the problems of training Texas' vocational teachers and improving the efficiency of its industrial workers. He launched the college's first extension courses for college credit in 1926; its first graduate courses on an extension basis in 1929; and its first "course on wheels," an extensive field course, in 1929.

(Continued on page 24A)

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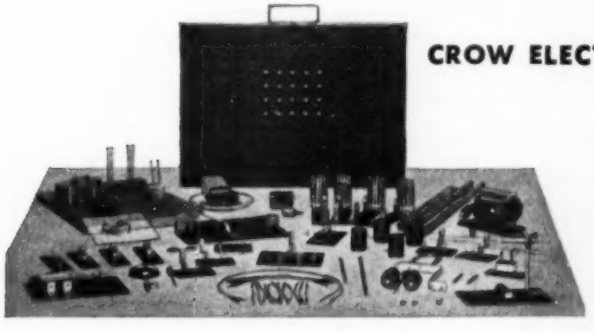
". . . I consider your publications and products unique and certainly the finest that I have been able to secure. I wish that the schools I attended had been equipped with them. I believe they fulfill a very great need on the part of the student, that of creating a genuine interest in a very important subject, regardless of his ultimate aim."

**Names will be furnished on request.*



CROW ELECTRI-KIT model 41B *for beginners*

Contains 115 parts for performing 230 fascinating experiments. Guaranteed absolutely safe. Covers permanent magnetism; electromagnetism; circuitry, switches and fuses; transformers; bells, buzzers, relays; thermostats; DC and AC motors and controls. Comes with 284-page, profusely illustrated work-manual. Used successfully by instructors with no electrical training. Complete with hardwood carrying case, Model 41B is priced at only $47.50.

For detailed bulletins about CROW ELECTRI-KITS write

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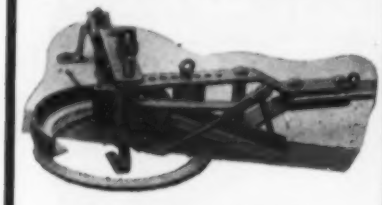
Teacher's pet . . .

HOSSFELD
UNIVERSAL IRON BENDER

Wrenchless Type — Model #1
Bends Flat, Round, Bar, Angle, Pipe



Samples of Bar Bending

HUNDREDS of shop instructors in vocational training departments of schools and municipal, state and government institutions are sold on the merit and utility of the Hossfeld Bender. Their maintenance departments, too, recognize it as practical and indispensable in the shop as a bench vise, capable of replacing a half dozen special machines. Proved in thousands of factories and repair shops as well, the Hossfeld Bender will neatly, quickly and accurately teach your students the 101 different bending jobs that they will be called on to perform in repair, maintenance and production work. For a better bender — specify **Hossfeld.**

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SPECIFICATIONS

#1 Bending Capacities
Standard Pipe & Conduit — up to 1¼" I.D.
Heavy Bends, Direct on Center Pin; "U" Bends on Cam Dies, 3" x 7/16" flat or ⅞" Round or Square Cold
Sharp Square Bends — 3" x ¼" Cold
Ornamental Iron Work — 2" x 3/16" Flat or ½" Round or Square, Cold
Eye Bolts — ½" Round or Square, Cold
Angle Iron — 1½" x 1½" x ⅛", Cold
Automobile Spring Eyes — 3" x ⅝", Hot
90° Bends on Conduit, Heavy Wall, or Standard Pipe — 1" Cold

●

GET THE FACTS!
Write today for illustrated bulletin.

HOSSFELD MFG. CO.
438 W. 3rd Street Winona, Minnesota

PERSONAL NEWS

(Continued from page 22A)

In 1946 he was elected president of the National Association of Industrial Teacher-Trainers, and in 1949 president of the American Vocational Association. He has also held high offices in the Texas State Teachers' Association and the Texas Vocational Association. In 1951 and 1952 he was given leave by the A. and M. System to assist the U. S. Bureau of Mines in reorganization of its educational program, conducting and supervising training programs for the Bureau's instructors in its eight regional fields.

Mr. Williams was married December 21, 1920, at McKeesport, Pa., to Miss Jane Wheeler of Winsted, Conn., who was at that time supervisor of music in the McKeesport public schools. They have a daughter, Jane, married to Dr. George T. Dugan, D.V.M., of Texarkana, Ark. Their son, E. L., Jr., is commanding officer of an artillery unit at Ft. Lawton, Wash.

GUSTAVE MICHELSON JUDGES FORD I.A.A. ENTRIES

Gustave Michelson, retired teacher, Boys' Technical High School, Milwaukee, Wis., studies a patternmaking and molding entry in Ford Motor Company's Industrial Arts Awards competition. Mr. Michelson is one of 29 leading industrial educators and industry

Gustave Michelson

representatives who judged the teen-age handicraft in Dearborn, Mich. In the 1954 Ford-sponsored nationwide program, 5200 school-made projects were entered in the 14 divisions, competing for cash awards and outstanding achievement recognition. Winners will be announced later this summer.

HAROLD MILNES RETIRES

Harold Milnes retired this June from the faculty of The Stout Institute, after 45 years of teaching shop, foundry, and patternmaking, 38 of these at the college.

Mr. Milnes' interest in industrial education began long ago in Kansas City, Mo., when Milnes, then a student in the Kansas City Manual Training High School, built a five-horsepower motor which was placed in the machine-shop exhibit at the St. Louis World's Fair in 1904.

After graduation from the Manual Training High School, Mr. Milnes attended school at the Armour Institute of Chicago, and later was employed for a year and a half by the Western Electric Company.

Returning to Missouri, he was employed by the Kansas City Electric Light and Power Company, before going to Evansville in 1908 on his first teaching job.

He continued as machine-shop instructor at Evansville High School for seven years before coming to The Stout Institute, where he has taught ever since.

After earning credits toward a bachelor of science degree at Columbia University and Chicago University, Mr. Milnes transferred those credits to The Stout Institute, where he received his degree in 1922. He was granted his master of science degree at Iowa State College in 1936, after having also attended the University of Minnesota.

Mr. Milnes has made thousands of friends during his teaching career and they all wish him good luck for the future.

ACTING SCHOOL HEAD CHOSEN AT OSHKOSH

Frank R. Stepp has been named acting director of the Oshkosh (Wis.) Vocational School to succeed A. M. Bleyer, director for 33 years, who died unexpectedly recently at the age of 70.

Mr. Stepp has been co-ordinator at the school and active in adult education.

NEW PRESIDENT OF PRATT INSTITUTION INAUGURATED

Dr. Francis H. Horn, former executive secretary of the Association for Higher Education, was formally inaugurated as president of Pratt Institute, Brooklyn, on Saturday, May 15, 1954.

Dr. Horn has also held administrative posts at the Johns Hopkins University, Baltimore, Md.; Quinnipiac College, New Haven, Conn.; and the Army University at Biarritz, France. He is a graduate of Dartmouth, the University of Virginia, and Yale University, and a World War II veteran.

The fourth president of the Institute, Dr. Horn is the first who is not a member of the Pratt family. He is an outspoken advocate of the professional education in which Pratt Institute pioneered, and for which it has long been noted.

VOCATIONAL SCHOOL TEACHERS HONORED

Ten faculty members who have been at the Milwaukee Vocational School 35 years or more and 11 others who have been there 25 years were honored recently by the school's branch of the Wisconsin Education Association.

Receiving gold pins for service of 35 years or more were Mrs. Cora Belding and Ira Pilliard, 41 years; Robert W. Tarbell and Lester Larson, 40 years; Miss Clara Peters, 37 years; Miss Dorothy Patten, 36 years; and James Sidlow, Leo Hercules, Dr. John Davies, and Miss Isabel Scholl, 35 years.

Receiving silver pins for 25 years of service were William Brazier, Mrs. Muriel McLuen, Alvin Anderson, Hans Koch, James Summitt, Mrs. Gertrude Merkel, William J. Shogren, Arnold Mickelson, Jacob Van Kooy, Mrs. Ann Boschke, and John Shaw.

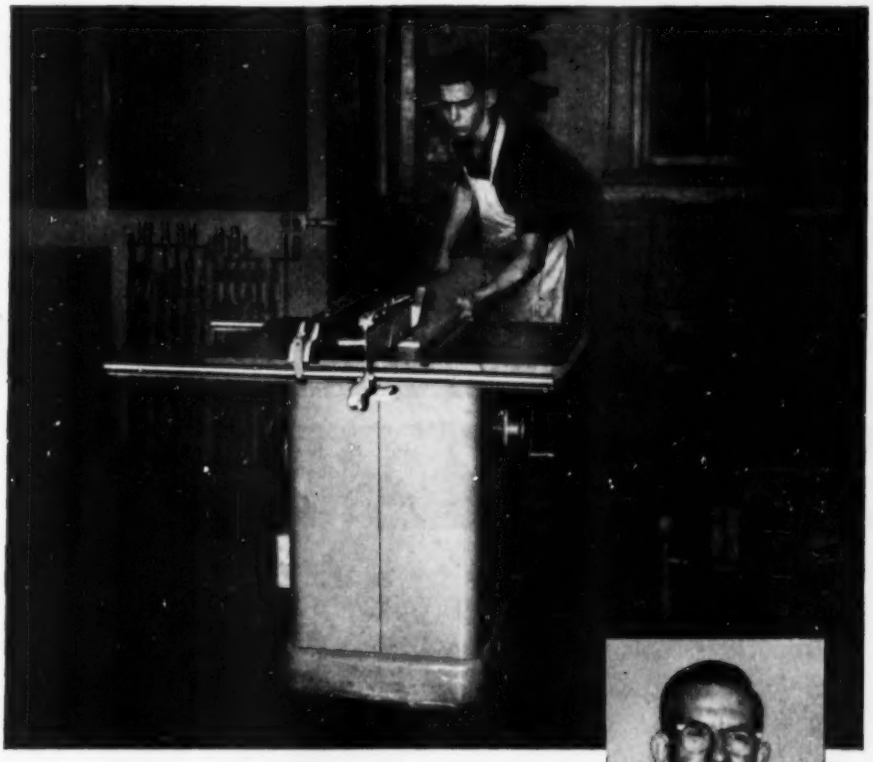
EVERETT GEORGE BARBER

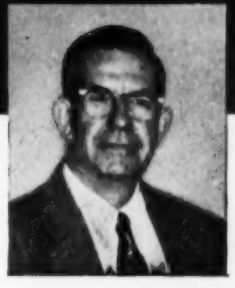
Everett George Barber was born in Cherryvale, Kans., on September 17, 1887. He attended common and high school in that city, being graduated from high school in 1905.

He enrolled as a freshman in the Engineering School at Kansas University in September, 1906. In June, 1907, he attended County

(Continued on page 26A)

To Teach Shop Teachers CCNY Uses Rockwell-built DELTA Power Tools





Prof. Spillman says of this DELTA Unisaw: *"That's a wonderful machine. It's remarkable the way it goes through a piece of wood."* CCNY uses nine DELTA Power Tools in their Industrial Arts Teacher Training Department.

"These DELTA Power Tools are the safest and finest that can be purchased," reports Prof. Albert R. Spillman, Director of Industrial Arts at the College of the City of New York. CCNY's completely modern Industrial Arts Teacher Training Department contains nine DELTA Power Tools.

These nine Rockwell-built DELTA Tools are employed in training Industrial Arts teachers for schools throughout New York State. The education is tuition-free, and students receive 1,440 hours of shop instruction in addition to regular curricula before receiving their BS in Education. Explaining why so much DELTA equipment was purchased, Prof. G. K. Wiggins, Woodshop Instructor, remarked that "When these boys go to teach, they will find the majority of schools equipped with DELTA tools, and they should be very familiar with them."*

Learn how you and your shop students can profit from the accuracy, the safety, and the remarkably easy operation of DELTA Power Tools. Send the coupon for full information.

*More than 65% of American Schools are equipped with the same DELTA Quality Power Tools so widely used throughout industry, and in home workshops! No wonder DELTA is the natural choice for Industrial Arts Instruction in *your* school.

DELTA QUALITY POWER TOOLS

Another Product by **Rockwell**

DELTA QUALITY MAKES THE DIFFERENCE

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☐ Please send Delta AB-53 Catalog.
☐ Please send name of my nearest Delta Dealer.

Name _____

Address _____

City _____ Zone ____ State _____

PERSONAL NEWS

(Continued from page 24A)

Teachers Institute and secured a third grade certificate with the intention of teaching the following year. July 2, 1907, he began working as a relief man for the Missouri, Kansas & Texas Railroad Company. In the spring of 1922, after working for various railroads in various capacities, and working as cashier and chief clerk in the freight office of the St. Louis & San Francisco Railroad in his home town for a number of years he found that if he was going to secure advancement he would have to go out on the road as a traveling representative for the company and decided that the "30-day relief period was about up." In September, 1922, he was granted a 60-day leave of absence and enrolled as a sophomore in the industrial-arts department of the Kansas State Manual Training and Normal School at Pittsburg, Kans.

In September, 1923, he was hired as a wood-shop instructor in the industrial-arts department of Salina High School, teaching on a three-year special certificate. He remained in this department for thirty years. By returning to Pittsburg the summers of 1924, 1925, and 1926 he qualified for his degree of bachelor of science in education, and by attending summer school at Kansas State College, Manhattan, in the summers of 1933, 1936, and 1938, he qualified for a master's degree in Education. During World War II he was assigned to teach preflight aeronautics, preinduction electricity and preinduction radio in the Salina High School.

During his 30 years of service he sponsored Hi-Y for four years, was one of the senior class sponsors for most of the time, assisted in National Honor Society decorations and initiations for 25 years, taught night classes in ARA (American Railway Association) Rules, for railroad-repair trackmen and car inspectors; had an electrical night class for electrical workers in Salina; taught furniture repair and refinishing; electronics for electrical workers; apprenticeship classes for electricians; plumber's, sheet-metal worker's and bricklayer's apprentices. For three years he taught classes in engineering drawing and descriptive geometry for Kansas Wesleyan University from 4:15 to 5:45 p.m. three days a week.

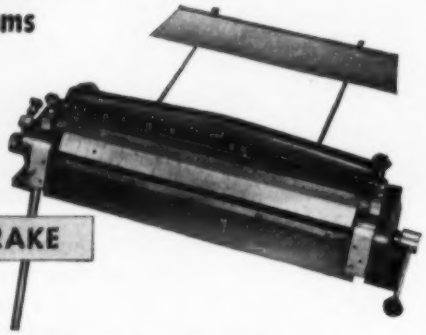
He retired at the close of the 1952–53 school year and accepted a position in the estimating department of Wilson & Company, Engineers of Salina.

He married Miss Ethel Martha Barker, September 5, 1913. Has one daughter, Miss Elinore L. Barber, assistant professor of Piano and Theory, Hastings College, Hastings, Nebr.

Was elected to Phi Sigma Pi, industrial-arts honorary fraternity while attending school at Kansas State Teachers College at Pittsburg, Kans., and to the Phi Delta Kappa while working toward master's degree in Kansas State at Manhattan, Kans.

BERKROY 24" SHEET METAL TOOLS

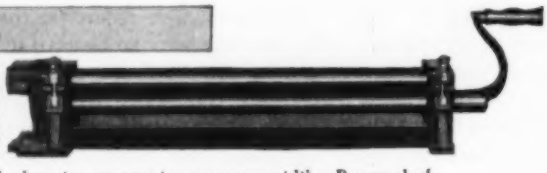
Enlarged Training Programs Possible With These Production Tools of Advanced Design



24" BOX AND PAN BRAKE

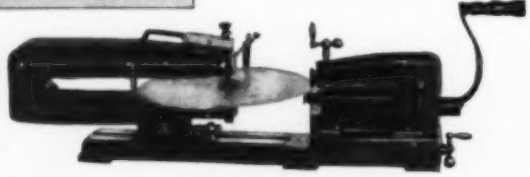
Turning a knob provides infinite adjustment to any angle from 0° to 135°. Forms any size box or pan from ⅛" to 24" by ¼" graduations. Makes intricate folds, reverse bends and radius bends on sheet steel up to 16 gauge and up to 24" wide. Bending leaf operates on Torrington Needle Bearings. Full 1" clearance between top fingers and anvil. Maximum 2½" box or pan depth permits deeper bends.

24" SLIP ROLL



Finger-tip controls on both ends of top roll permit quick adjustment for any material thickness within capacity of unit. Will accurately roll 24" widths in 20 gauge mild steel—heavier gauges in narrower widths. Removal of work is easily accomplished due to the spring loaded, hinged, top roll. Heavy duty rolls 1½" diameter—distortion proof channel iron base, enclosed gears and oilite bearings are a few of many features.

24" RING AND CIRCLE SHEAR



Equipped with MICRO-FEED control of circle diameters—an exclusive feature. Cuts rings and circles up to 24" diameter. Handles a wide variety of trimming operations, strip cutting and contour cutting on sheet metal up to 20 gauge. Cutters are hardened, tempered tool steel. 32" x 7" bed length, 12" x 4½" shear, and 21" x 3¼" clamping head. Accurately machined, enclosed gears and rugged construction throughout.

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For catalog information, write to
BERKROY PRODUCTS, INC.
2512 N. ONTARIO STREET • BURBANK, CALIFORNIA

GENERAL ELECTRIC EDUCATIONAL SERVICES

George A. Rietz, 1564 Regent Street, Schenectady, N. Y., has been named manager of a newly established grants and services section in the General Electric Company's Educational Relations Services Department, it was announced by Kenneth G. Patrick, manager of the department.

Rietz, in his new position, will be responsible for GE's expanding program with educational institutions and groups.

This involves scholarships, fellowships, grants, instructional equipment assistance, and co-operative educational programs with schools, colleges, universities, industries, and other groups.

WILL TEACH AT SAN FRANCISCO STATE COLLEGE

Dr. Mary-Margaret Scobey has left Syracuse University to assume educational responsibilities in California, her native state. Miss Scobey has for the past two years acted as Assistant Professor of Education in the teacher preparation program of Syracuse University. During that time she developed a new course for elementary teachers entitled, "Introducing the Child to Industrial Processes." During the 1954 summer session at Stanford University, Miss Scobey taught two industrial-arts courses for elementary teachers, one dealing primarily with wood construction processes, the other with such media as ceramics and textiles. In September, she will assume full responsibility as a member of the faculty of San Francisco State College. Her work there will be primarily with the elementary teacher education program, contributing to both the instructional and supervisory programs.

DR. FITZPATRICK RETIRES

Dr. Edward A. Fitzpatrick retired recently as president of Mount Mary College, Milwaukee, Wis.

He has taken a leading role in higher education circles and in promoting vocational schools, the training of the handicapped, and training for public service. He drafted the first minimum salary law for teachers.

He had an important part in setting up selective service machinery in both World War I and World War II. The presence of

Major General Hershey, national selective service director, at the dinner in tribute to Dr. Fitzpatrick, and the praise General Hershey paid to the guest of honor, were indications of the national debt to Dr. Fitzpatrick for that service.

Milwaukeeans owe additional gratitude to Dr. Fitzpatrick for wide public and community service.

DESIGNER HONORED

The Industrial Designers' Institute awarded its Gold Medal to Chicago designer Dave Chapman for his work in the creation of the new Brunswick line of school furniture.

Presentation of the award was made at Chicago's Ambassador East Hotel on June 24, at a gathering of some of the nation's outstanding industrial designers.

♦ DR. MAURICE D. KILBRIDGE, director of the department of industrial engineering at Illinois Institute of Technology, Chicago, has been selected to help draw up a five-year plan for the economic and industrial development of Pakistan.

Dr. Kilbridge, who has been granted a leave of absence by Illinois Tech to serve as a consultant to the government of Pakistan, left on the project early in June.

♦ DR. WILLIAM F. RASCHE, director of the Milwaukee Vocational and Adult Schools, received the civic service award of the Milwaukee Eagles on June 29 for "Outstanding Community Service."

♦ "Walt's Workshop" TV program has now been put on film and is being shown over a steadily increasing number of television stations. According to Frank J. Havlicek, assistant to the president of Reid H. Ray Film Industries, who are filming and distributing Walt Durbahn's program, television offering has a real place in the entertainment field.

Television stations which have recently begun to carry "Walt's Workshop" include WHO Des Moines and KLZ Denver. Stations will also handle the show within the next thirty days in Philadelphia; Cleveland; Montgomery, Ala.; Tulsa; Wichita; Omaha; Austin, Minn.; Colorado Springs; Holdredge, Neb.; Springfield, Mo.; and Bismarck, N. Dak.

"Walt's Workshop" has been shown "live" over WNBQ-TV, Chicago, for the past six years. It is a half-hour presentation. Fifty-two such TV films are now being made.

♦ DR. FRANCIS W. DALTON has been made associate professor, department of vocational education and practical arts, School of Education, University of Michigan, Ann Arbor, Mich.

Dr. Dalton, prior to coming to the university in 1941, was chief of trade and industrial education in the State Department of Public Instruction from 1937–41. He is author of *The Development of Industrial Education in Michigan* and coauthor of a book on *Social and Economic Problems of Democracy's Workers.*

♦ A. A. VEZZANI has been made assistant professor of vocational education and practical arts, School of Education, University of Michigan, Ann Arbor, Mich.

Before coming to the university in 1944 Mr. Vezzani was a teacher of a variety of industrial subjects including drafting, pattern-making, tool and die design, machine shop, auto shop, electrical shop, and radio. Most of his experience was in the Calumet and Pontiac schools. He is coauthor of the books, *Die Design* and *Use of the Machinerys Handbook,* has developed several study guides and teachers' manuals for drafting and apprentice training, and has written numerous articles for professional journals. He is also active in the field of driver education.

♦ Teachers retiring from the service in the Los Angeles city schools this year include: Leslie Appel, Alex Badger, James Bailie, George Blake, Lloyd Brauer, William Cole, Walter Ellis, Noah Horning, William Jepson, Doctor Jones, Frank Kenyon, Elmer King, Alex MacKenzie, Grace McAlpine, Alex McDonald, George Parker, Charles Reuter, Winfred Sherwood, John Swanson, William Vaubel, and Albert Vogler.

♦ HOLLIS W. DAHLOR, director of vocational education in the Kansas City school system, was a member of the summer faculty of the industrial education department at Northwestern State College, Natchitoches, La. He taught a course in vocational guidance and assisted with a special problems course for vocational-industrial instructors.

News Notes

WESTINGHOUSE FELLOWSHIPS

Thirty-two high school science teachers from 20 states and the District of Columbia are attending a special six-week course in chemistry, physics, and mathematics at Carnegie Institute of Technology.

This special summer session is made possible by the Westinghouse Educational Foundation, which awards a Westinghouse Science Teacher Fellowship of $250 to each of the 32

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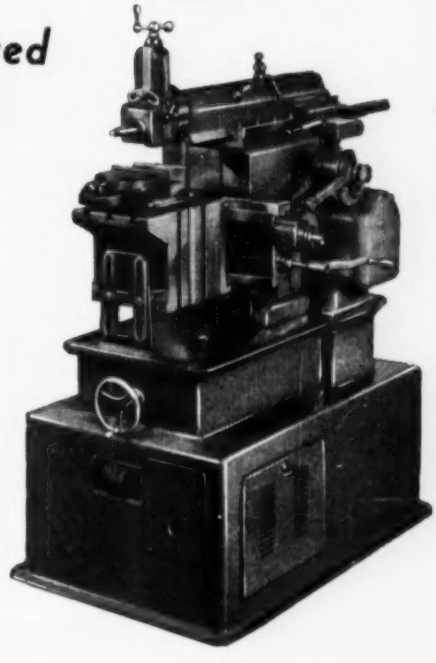
SHELDON
CHICAGO U. S. A.

12" Back-Geared SHAPER

Are your graduates actually ready for industry?



With this 12" back-geared industrial shaper, your students can do full-sized, close tolerance shaper work. Can overcome a novice's natural fear of large, full-powered machine tools — can become competent, confident operators who know what a real shaper can do.

Priced within the range of school shops, this man-size 2000-lb. quality shaper is industrial in design, capacity, power, controls, features, and "big tool feel." It is a safer shaper for school shops because all changes and adjustments can be made from one operating position — no reaching over. It's safer because all gears, belts, and moving parts, other than the ram itself, are fully enclosed and all speed changes are made with an external hand wheel. It is becoming the standard shaper in the better school shops.

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SHELDON MACHINE CO., Inc.

Builder of Sheldon Lathes, Milling Machines, Shapers, and Sebastian Lathes

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NEWS NOTES

(Continued from previous page)

teachers who are selected by Carnegie Tech.

The program is directed by full-time staff members of Carnegie's College of Engineering and Science. Borden P. Hoover, associate professor of mathematics, is in charge.

♦ The DeVilbiss Company spray painting courses begin in the classroom where the spray gun is thoroughly explained. The theory sessions extend to the other equipment which a spray operator will use. Every item constituting a complete spray painting outfit is thoroughly covered. Air pressures, material viscosities, film thicknesses, and all of the ramifications of painting are discussed. The pupils also are taught to assemble and disassemble equipment. Then every student is given an opportunity to prepare materials and spray them.

The dates for courses of instruction in industrial spray finishing for 1954 are: September 13, October 11, November 8, December 6.

Enrollment in the school is free, the only cost to the student being his board and room. Enrollment applications may be obtained from the *DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.*

♦ The National Association of Home Builders is repeating its Model Home Contest for secondary school students this school year. The contest is open to all students in grades 7–12 in any public, private, or parochial schools in the continental United States.

Prizes include a $500 first prize, plus nine awards for other winners. The Grand Prize Winner and his teacher-sponsor also win a trip to Chicago, Ill.

Write the *Model Home Contest Director, National Association of Home Builders, 1028 Connecticut Ave., N.W., Washington 6, D. C.*

♦ A new visual teaching aid for instructors of drafting has been designed and developed by the Educational Division of the Frederick Post Company. It is called a "Line Gauge and Lettering Guide" and complies with the most recent reference data as set forth in the *American Drafting Standards Manual.*

Lithographed on durable, hard-finished stock in a convenient size, it provides an easy and quick reference for the student when placed on a T square, drawing board, or desk top.

Available free to drafting instructors in quantity for class distribution by writing the *Frederick Post Co., 3650 N. Avondale Ave., Chicago 18, Ill.*

♦ George Westinghouse Scholarships, valued at $3,170 each, have been awarded to ten of the nation's outstanding high school seniors who plan to take degrees in engineering or the physical sciences at Carnegie Institute of Technology.

The ten winners were selected from applicants representing all 48 states and the District of Columbia.

Mental ability, engineering aptitude, character, and qualities of leadership, as shown in extracurricular activities and in school and community affairs, formed the basis of the final awards.

These scholarships provide $680 tuition for each of four years at Carnegie, plus an additional sum of $450 for other expenses during the total four years.

For further information write to *Technical Publicity Dept., Westinghouse Electric Corp., 401 Liberty Ave., Box 2278, Pittsburgh 30, Pa.*

♦ Six-page bulletin describes American Silver Company's new ASC-1 thermostat metal strip as well as fabricated bimetal elements . . . for use in the automotive, electrical, heating, appliance, instrument, and control fields.

For a copy write to *Thermostat Metal Division, American Silver Co., Inc., 36-07 Prince Street, Flushing 54, N. Y.*

♦ The Ingersoll Milling Machine company of Rockford, Ill., has established a scholarship program at Illinois Institute of Technology, Chicago, for the benefit of young men in the Rockford area who are eager and able to prepare themselves for careers of responsibility in industry.

The scholarships will finance all tuition charges at Illinois Tech for four years and provide $300 extra per year toward living costs for two qualified applicants who are ready to enter college in September.

♦ A home construction short course for mortgage officers was conducted by the University of Illinois on the Urbana campus, July 12–21. The course was presented by the Small Homes Council in co-operation with the Division of University Extension.

Registration was opened to persons engaged in home financing and appraising.

♦ Carl M. Humphrey, director of Agricultural Education, State Department of Education, Jefferson City, Mo., will serve on the Jury of Award for a national arc welding award program for farm high school students sponsored by The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio.

♦ The Jam Handy Organization announces the availability of the 10 minute, 16mm. sound motion picture, "The Man Who Sells."

This motion picture demonstrates the importance of the salesman in our country, is produced for Chevrolet salesmen, and is made available to other business and educational groups which are interested in its inspiring and patriotic message.

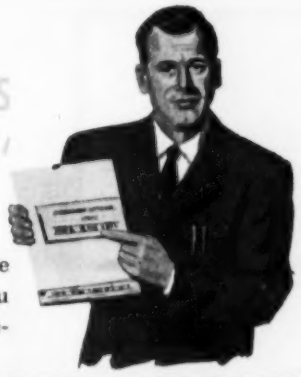
The picture may be had from the Jam

(Continued on page 30A)

SHELDON
FURNITURE
is Educationally Correct
It's thoroughly thought out, and developed according to the highest standards of structure and design. It's ready for rugged use. Makes your classes run smoother because each piece is designed precisely for the job you want it to do, with the kind of work space you want and the right kind of storage — where you need it.
Call in the Sheldon Man to help you plan.
Sheldon FURNITURE
E. H. SHELDON EQUIPMENT CO., Muskegon, Mich.

Send For "Electrical Requirements for High School Electric Shops"

(INDUSTRIAL ARTS LEVEL)



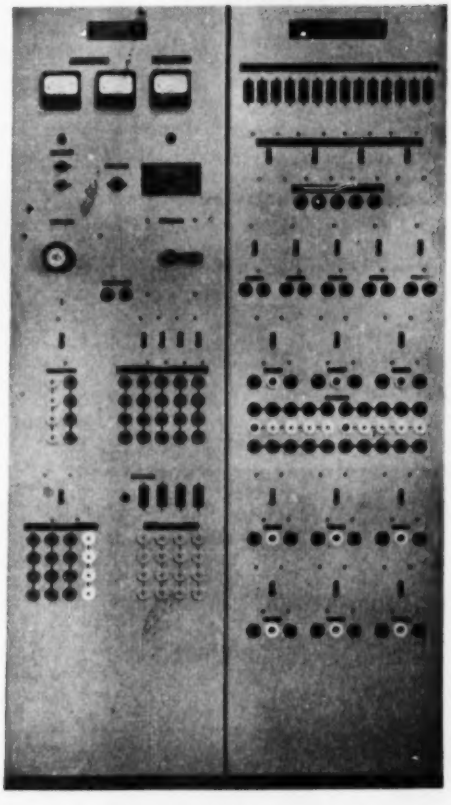
You should have our Booklet No. 205, with the above title . . . *especially* if you are planning a new shop or re-vamping your present one. This booklet will give you valuable suggestions. It offers a shop layout plan and lists fundamental requirements. Fill in the coupon below for prompt attention by us.

Safe, Timesaving, Up-to-the Minute Equipment

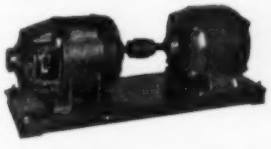
SERVICE UNIT
A typical bench unit for a 2- or 3-wire variable service, 120V a-c and a continuity test circuit. Single or double faced. Many other types available.

DISTRIBUTION SWITCHBOARD

This controls and distributes all the various a-c and d-c currents required for any work in the Electric Shop.



CONNECTOR CORDS
Other types furnished to meet requirements.



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CHECK
Contemplating new Electric Shop ☐
Contemplating re-vamping present shop ☐

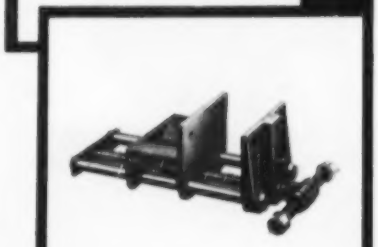
Name _____

Title _____

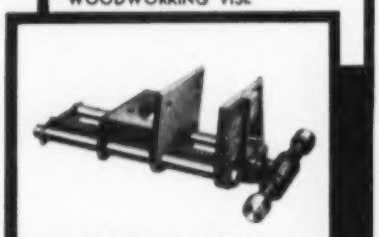
School _____

City _____ *State* _____

MACHINISTS' BENCH
Solid Jaw and Swivel Base



18-A DUAL PURPOSE
WOODWORKING VISE



CONTINUOUS SCREW
WOODWORKING VISE

TAKE YOUR PICK

from the complete
MORGAN LINE

Your School Shop will be better equipped when you specify, and insist on, Morgan Vises. You have your choice of a complete range of sizes and types with Morgan's 'Woodworkers' (with exclusive tubular steel handle), Machinists', Pipe and Combination Pipe Vises. Every vise UNCONDITIONALLY GUARANTEED.

Write for complete catalogue.

MORGAN
VISE COMPANY
112 N. JEFFERSON ST.
CHICAGO 6, ILLINOIS

NEWS NOTES

(Continued from page 28A)

Handy Organization's Film Distribution Department.

For further information write to: Film Distribution Department, *The Jam Handy Organization, 2821 East Grand Boulevard, Detroit 11, Mich.*

♦ The Stout Institute, Menomonie, Wis., announces that:

The out-of-state tuition for next year will be $25 per semester instead of the present rate of $100 per semester.

The Symphonic Singers, under the direction of Dr. Victor Hardt, will represent the state of Wisconsin at the biennial convention of the National Federation of Music Clubs of America in Miami, Fla., next April. More than one hundred vocal and instrumental musicians from Stout will tour ten states for two weeks en route to Miami.

The Stout building program is continuing. The new library was dedicated during the 1954 Commencement. Future students at Stout will have the finest library facilities available. The next building project will be a new women's dormitory which will be erected during the coming year.

♦ Illinois Institute of Technology ranks third among the independent institutions of higher learning in the state of Illinois in the number of alumni in *Who's Who in America.*

In the relative proportion of new names in Volume 28, to old names in Volume 27, Illinois Institute of Technology stands first in the state and seventh in the nation.

In both above categories this school precedes the sister institutions of Case, Rensselaer, and California Institute of Technology.

♦ A modern building of advanced design, enclosed entirely with plate glass and a concrete roof that will be suspended from exposed steel girders, will serve as the home of Illinois Tech's departments of architecture and industrial design, and of a soon-to-established department of urban and regional planning. It is to be erected on the Illinois Institute of Technology campus in Chicago during the coming year.

The building is being erected to provide proper facilities for the departments and to put them under one roof in connection with the Institute's creation of a new academic division which will foster their individual operations but permit meshing of their talents and equipment.

♦ One hundred college juniors are going to share in the 1954–55 school year, $50,000 worth of General Electric Company scholarships.

These scholarships are awarded to students in various engineering fields, business administration, marketing, manufacturing, employee relations, and public relations.

Awarding of the 100 scholarships for the 1954–55 school year is part of the General Electric Company's program to encourage interest in education and to help encourage students to prepare themselves for the better jobs in the industry.

♦ A nontechnical primer on framing a house, and building its skeleton, has been prepared by the University of Illinois Small Homes Council to help homeowners recognize and appreciate the various approved methods of construction.

The 8-page circular, "Wood Framing," tells advantages and disadvantages of two wall and five roof-framing systems. It also presents cost information resulting from a study sponsored by the federal Housing and Home Finance Agency.

Single copies of the circular are free from the *Small Homes Council, University of Illinois, Urbana, Ill.*, until September 1, after which they will be 10 cents.

♦ The Audio-Visual Materials Consultation Bureau of Wayne University announces the release of a new film strip entitled, "Program for the Nation."

This is another in the series of film strips treating contemporary affairs produced by the Bureau. The series is now in its fifth year of production.

This 35-frame black-and-white film strip, supplemented by a discussion guide giving background information, is available from the *Audio-Visual Materials Consultation Bureau, Wayne University, Detroit 1, Mich.* Prints sell for $3.50 each.

♦ Cincinnati has installed the last of its TV equipment and is readying programs for WCET, operating on Channel 48.

It will go on the air with a schedule of three hours a day five days a week. In September programming will be expanded to four hours daily, including a quarter-hour of in-school telecasting. Station officials also hope to include adult credit courses in the fall programming schedule.

♦ Teachers of Science will be interested to learn that the Department of Education, Division of Instruction, Elementary Education, Sacramento, Calif., has made available an electrical kit, and a model weather station kit, which contain all the essential items for doing the experiments in their study of electricity and weather.

♦ A University of Michigan survey of its educational TV audience shows that the University's Sunday Television Hour over WWJ-TV has a regular audience of half a million Detroiters. The study ran from January through March. It included 1668 persons in 764 households.

Of persons in the 30–50 age group who saw the programs one half were regular viewers. Among those in their twenties, there was less likelihood of regular watching, while there was a decided drop in "regulars" over 60 years of age.

A larger portion of people in the middle and high income brackets have watched the program than those in the $3,000 a year and under group. However, even in the lowest income group one fourth of the sample had viewed the University production.

About one third of the adults with grade-school education replied they had seen the TV Hour, while nearly two thirds of those with college training reported themselves as viewers. Somewhat less than half of the high school graduates had seen the program.

BROR G. DAHLBERG DIES AT 73

Bror Gustav Dahlberg, founder, former president, and retired chairman of the board of The Celotex Corporation, Chicago, Ill., died February 20 of a heart attack in his home at Miami Beach, Fla., at the age of 73.

Mr. Dahlberg was born in Sweden, coming to this country when 10 years old. He started out as an elevator operator, became chief clerk of a railroad system in 1906, engaged in furniture manufacture and then became a traffic and railroad rate counselor.

In 1916 he was named vice-president of a paper manufacturing company. He continued in this position until 1921, when he organized The Celotex Corporation, having developed a process of making structural insulating board from bagasse, the fibrous residue remaining after the juice is extracted from sugar cane.

He retired as president of Celotex in 1948 and as board chairman in 1951. He continued as a director of the corporation.

He also was a founder and former board chairman of Celotex, Ltd., English subsidiary in London. He organized and headed the South Shore Oil and Development Company and the South Coast Corporation.

A NEW HIGH SPEED PHOTOGRAPHIC FILM

A new high speed professional sheet film — Kodak Royal Pan — was recently announced by the Eastman Kodak Company.

The new film is twice as fast as previous films of this type. The increase in emulsion speed has been achieved, however, without any increase in film graininess.

The new film is expected to prove of tremendous value to press, commercial, portrait, illustrative, and industrial photographers. Its increased speed will be particularly helpful in these fields since it will permit photographers to make pictures which have heretofore been almost impossible.

The new film has an A.S.A. exposure index of 200 for daylight. The tungsten index is 160.

For further information see your local Eastman dealer, or write to *Eastman Kodak Co., Rochester 4, N. Y.*

NEW PITTSBURGH PAINT ROLLER COATERS

Two entirely new paint roller coater assemblies including a precision built lightweight coater featuring plastic caps and bearings plus a self-adjusting aluminum fin cylinder, have been developed by the Pittsburgh Plate Glass Company.

The first of these products is the deluxe "Gold Stripe" roller which has no parts to rust or corrode. It has a smooth, silent, easy action, and is provided with solid plastic bearings that will not mar surfaces.

The cover will withstand immersion in paint solvents, cleaners, and soap and water up to 24 hours. Covers may be easily changed from one paint to another without cleaning. They are furnished in a choice of wool, mohair, or dynel. All have a denser fill than average roller covers to provide better paint carrying capacity and maximum speed performance without spattering.

The deep-drawn one-piece metal tray designed for both "Gold Stripe" and "Red Stripe" rollers has no seams or sharp corners. It features a rolled safety edge and a large reservoir with quart-and-a-half capacity. A specially designed distribution panel prevents excessive fill of the roller. The shallow end of the tray is deeper than any now on the market to prevent slopping over while carrying. A dual-purpose support bracket provides a sturdy rest for the tray both for attachment to ladders or for use on flat surfaces.

For further information write to *Pittsburgh Plate Glass Co., 632 Fort Duquesne Boulevard, Pittsburgh 22, Pa.*

UNION CARBIDE SCHOLARSHIPS

New allocations of Union Carbide Scholarships to become effective in the fall of 1954 will bring the number of scholarships presently allocated to a total of 308 of a proposed goal of 400 scholarships.

Ten more educational institutions recently have been added to the program, bringing the total now participating to 34 liberal arts colleges and technical institutions.

Graduates of high schools and preparatory schools in the United States may obtain full information by writing to the *Secretary, Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N. Y.*

NEW DOCUMENTARY MOVIE ON ATMOSPHERIC GASES

A new 16mm. color motion picture with sound entitled "Whatever We Do" has just been produced by Air Reduction Sales Company. It is a basic documentary film about the atmospheric gases — oxygen, nitrogen, argon, helium, and the other rare gases, covering their key uses in industry, and the numberless ways they appear in our daily lives as parts of familiar products.

The story of how gases in pure form are separated individually from the air is described with the assistance of detailed animation. Also, there are views of the huge buildings and massive pieces of machinery required to separate, store, and package these invisible elements.

Some of the film illustrates the role of the following gases: oxygen in steel refining and in life-saving hospital oxygen tents; oxygen or inert gases in the welding and cutting of metals for today's automobiles, airplanes, ships, trucks, and trains; neon for electric signs; argon in incandescent light bulbs; helium for lighter-than-air craft; nitrogen in nylon manufacture, food packaging and testing telephone cables, and a host of other uses, are clearly explained and vividly pictured.

The film may be borrowed from any Air Reduction district office or by getting in touch with *Air Reduction Sales Company, 60 East 42nd Street, New York 17, N. Y.*

THE STORY OF ALUMINUM

The how, what, why, and when of aluminum are told and illustrated in a 16-page booklet — *The Story of Aluminum* — just published by Kaiser Aluminum & Chemical Corporation.

Copies may be obtained for classroom use by writing to *Kaiser Aluminum, 1924 Broadway, Oakland 12, Calif.*

HIGGINS OFFERS SIX ART BOOKS AT ATTRACTIVE PRICE

Higgins Ink Company of Brooklyn, N. Y., makers of Higgins American Drawing Inks

(Continued on page 34A)

SO YOU'RE GOING TO BUY A PLANER

Then here are some facts which you should have before purchasing

	BOICE-CRANE	*MAKE A*	*MAKE B*	*MAKE C*
1-piece, Lifetime Aligned Frame	Yes	No	No	No
Optional Feed Rates through simple switch of pair of gears	Yes	No	No	No
Spring-loaded Feed Roll Pressure adjustable without wrenches	Yes	No	No	No
Self-Aligning Cutterhead Bearings	Yes	No	No	No
Cutterhead Bearings locked in place	Yes	Yes	No	Yes
Ball-Thrust Bearing equipped Table Raising Screws	Yes	Yes	No	Yes
Capacity	12⅛" x 4"*	13" x 5"	12" x 4"	12" x 4"
Shortest piece handled	6½"	6"	6"	7½"
Feed Rolls, diameter	2"	1⅜"	1¾"	2"
Cutterhead, diameter	2⅜"	2 23/64"	3¼"	3"
Cutting circle	2⅞"	2 9/16"	3½"	3¼"
Horsepower required	1½–2 h.p.	3 h.p.	1–2 h.p.	1½–2 h.p.
Cuts per inch at standard feed rate	60	75	60	60
Feed Rate at 3600 r.p.m.'s	14	12	14½	13½
Shipping Weight, with 2-h.p. motor, stand, lbs.	680	728**	565	500
Optional Drives — Direct-Motor-Drive or V-Belt	Yes	No	Yes	No
Shock-proof Feed Gear, integrally housed, using solid lubricants	Yes	No	No	Yes
Least costly model, less motor	$365.00	$545.00	$249.50	$335.80
Manufacturer building "Pony" Planers since	1933	1950	1936	1945

*Handles 99% of the average boards used. Planers with only one inch more capacity (only 7% more width and 25% more thickness) cost $180 (49%) more and use 50% more power. Furthermore, most boards exceeding 12 inches in width or 4 inches in thickness also exceed 13 inches in width and 5 inches in thickness.

**3 h.p.

Suggestion: Glued-up pieces, frequently 24 in. or more wide, are finished most economically by using a BOICE-CRANE planer before gluing, and then sanding off excess glue with a BOICE-CRANE 60-inch Band Stroke Belt Sander. So, for hundreds of dollars less than the cost of an outsize planer (rarely used for stock over 12-in. wide or 4-in. thick), you can own both of these BOICE-CRANE machines.

BOICE-CRANE COMPANY

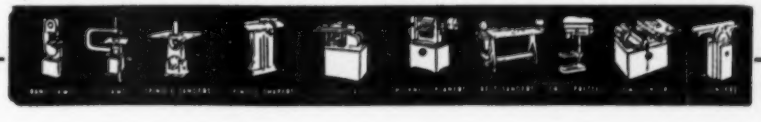
932 CENTRAL AVENUE TOLEDO 6, OHIO

Please send free literature on *Boice-Crane* Thickness Planer

Name.....

Street.....

City & State.....



When You Specify POST-

POST

DRAWING INSTRUMENTS

The skill and precision of master instrument craftsmen combined with the use of only the finest materials guarantees POST drawing instruments ageless excellence and the user a lifetime of accurate service.

POST

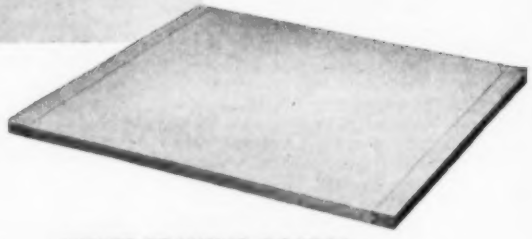
Transparent TRIANGLES

Made of the finest, seasoned, transparent celluloid. Available with or without finger lifts in a complete range of standard sizes.

Other Transparent Items
CURVES · PROTRACTORS
ADJUSTABLE TRIANGLES

POST

DRAWING BOARDS



Basswood

Made of the finest, clear white basswood, selected and seasoned under scientific control. Smooth finished working surfaces on both sides. Available in complete range of standard sizes.

AIRLITE DRAWING BOARDS

Super lightweight drawing board with balsawood core. Skillfully manufactured to insure "non-warp" accuracy. Complete range of standard sizes.

POST **Waterproof**

DRAWING INKS

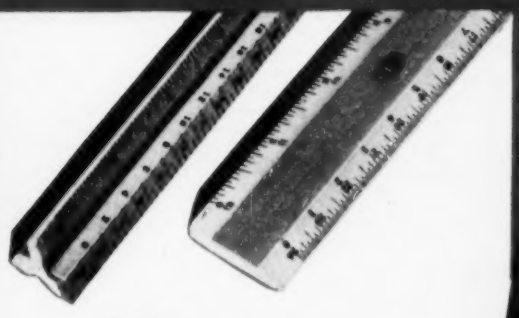
Brilliant, and permanent. In a complete range of colors and sizes. Intense black, plus white, blue, green, yellow, brown, scarlet, vermilion, brick red, orange, violet, carmine and indigo.

POST **DRAWING and TRACING PAPERS**

There is a POST drawing and tracing paper to suit every requirement. Available in rolls, pads or sheets. Ask about them!

Choose ALL Your Drafting Needs

You Are Getting the Best!



POST **SCALES**

Triangular and Flat

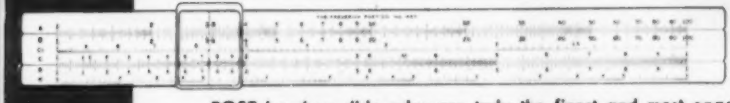
Available for the student architect or engineer in a wide range of scale combinations. Full or open divided graduations.

POST **REMINDER LIST**

- Cross Section Papers
- Curves
- Drawing Boards
- Lightweight & Regular
- Drawing Inks
- Drawing Instruments
- Drawing Papers
- Dusting Brushes
- Envelopes
- for Drawing Papers
- Erasers
- Erasing Shields
- Field Books
- Lettering Guides
- Lettering Paper Blocks
- Pencils
- Pencil Pointers/
- Pen Points–Holders
- Protractors
- Scales
- Sketching Pads
- Slide Rules
- Strathmore
- Artist Board
- Templates
- Triangles
- Tracing Papers
- Tee Squares

POST **SLIDE RULES**

Bamboo Construction

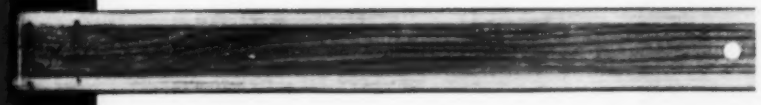


POST bamboo slide rules are truly the finest and most exact mathematical tools available. Skillfully constructed from carefully selected, seasoned, then laminated bamboo. Scales are engine divided on snow-white celluloid faces. Student, pocket and professional rules available.

WRITE FOR SPECIAL PRICES!

New literature available with unusually favorable school prices. POST's Educational Division is ready to supply quotations promptly for large quantity requirements.

POST **T-SQUARES** Transparent Edge and Plain



Care and exactness in the selection of materials as well as manufacturing processes guarantee dependability and lifetime accuracy of all POST T-squares. Available plain or with transparent edge in all lengths to accommodate standard size boards.

POST *Symbol of Quality*

FREDERICK POST COMPANY

2650 N Avondale, Chicago 18

DETROIT · CHARLESTON, S. C.

BOSTON · LOS ANGELES · BIRMINGHAM

from POST'S Complete Quality Line

NEWS NOTES

(Continued from page 31A)

in Waterproof Black and Colors, are now offering their six popular art books as a boxed set, at a saving. Though some of these books have been sold individually for years, and have run into several editions because of continued demand, they have never before been offered as one "package" — practically an art library — at a reduced price.

The six titles in this set are: *Technical Illustration, Color Digest, Techniques* (with Pen and Brush), *Lettering, Cartooning,* and *Projects.*

For further information about this attractive offer write to *Higgins Ink Co., Inc., 271 Ninth St., Brooklyn 15, N. Y.*

NEW EDITION OF WHITTLING BOOK BY X-ACTO

X-acto, Inc., announces the publication of a new and expanded 40-page edition of its How-To-Do manual, "Whittling is Easy with X-acto," prepared in conjunction with Leroy Pynn, Jr., authority on wood carving.

The X-acto Whittling Manual has gone through several editions and has sold over 100,000 copies since its introduction in 1945. It contains simple and clear instructions for beginners in the art of whittling (the proper tools, the woods to select, cutting techniques, finishing and painting) in addition to illustrated step-by-step projects for carving interesting figures.

The new edition contains 34 simple projects of which 18 are devoted to new Indian woodcraft designs, such as a plains warrior on horseback, a little Indian scout, a buffalo, a Hopi Kachina doll.

The book is available at 25 cents at all hobby shops or directly from *X-acto, Inc., 48–41 Van Dam Street, Long Island City 1, N. Y.*

FLAMEPROOF TOWELS

Development of a process to flameproof a new, all cotton, disposable towel for industrial use was announced recently by the Leshner Corporation.

The Leshner towel absorbs more than six times its own weight in grease, oil, or water, and may be used for wiping, cleaning, polishing, or other industrial uses. These towels are uniform in size, quality, and weight; may be used wet or dry, and eliminate hazards of grease-soaked rags.

The flameproof towel is offered in colors of pastels or dark shades and white. Size is 12 by 18 in., but will be cut to individual specifications if desired.

For further information write to *The Leshner Corp., Hamilton, Ohio.*

TRAVELING EXHIBIT TELEVISED FOR STUDENTS

Greater co-operation between business and education is brought about by a closed circuit TV presentation of an Eastman Kodak Company's traveling display in an experiment carried on at Purdue University.

In January, 1954, Purdue invited the Eastman Kodak Company to bring its exhibit, "Optics for Industry," to the campus to help students learn more about the application of optical methods to gauging and inspection.

Currently touring the country in a 35-ft. truck, the exhibit includes two Kodak Contour Projectors designed for quick, accurate, and economical inspection of many mechanical parts, also a number of panels illustrating the theory and application of this equipment.

Normally 12 to 15 people are invited to visit the truck simultaneously. There they are shown a movie and hear a talk illustrated by the display panels. In order that a maximum number may benefit in the shortest period of time, a Utiliscope closed circuit TV camera and screen is used in conjunction with the Kodak truck parked outside of the school. The TV unit is then set to transmit images from inside the truck to a nearby classroom.

In this way approximately 2000 people visited the truck in two days. This technique has definite possibilities of value both to schools and manufacturers offering similar traveling displays.

CHALLENGE PRESENTS
CUTTERAMA
Diamond (Hydraulic Clamp) Power Cutter
Diamond (Hand Clamp) Power Cutter
Challenge 370 Automatic (Hydraulic Clamp) Cutter
Challenge 193-265-305 (Hand Clamp) Power Cutter
Challenge 265-305 (Hydraulic Clamp) Power Cutter
Challenge 265-305 Lever Cutter
AN ALL-STAR SHOWING OF AMERICA'S MOST DEPENDABLE LINE OF CUTTERS!

Put yourself in the picture — with a rugged Challenge Paper Cutter that's as right for you as profit itself!

Shown here are some of the fine models that help make Challenge the most extensive and popular line in the country today. In all, there are 7 styles and 6 sizes to choose from, ranging from lever cutters in bench and floor models — to power cutters with hand or hydraulic clamp. Each has been built to one standard of quality — *Challenge quality* — with special emphasis on *safety . . . speed . . . and sureness* of operation.

Yes, the Challenge line of dependable paper cutters is truly panoramic in scope. Every style . . . every size . . . designed to save you time, labor and money — and insure more profitable cutting. Write for full details today. 762

THE CHALLENGE MACHINERY CO.

Office Factories and Show Room: Challenge TRADE-MARK (R) GRAND HAVEN MICH.

Challenge Owns The Printing Equipment Manufacturing Rights of *Morgans & Wilcox Manufacturing Co.*

New Publications

Enameling on Copper and Other Metals

By Thomas E. Thompson. Paper, 42 pp., 6 by 8⅞ in., illus., $1. Thomas C. Thompson Co., Highland Park, Ill.

This little manual gives concise and clear directions for enameling. It describes the tools and equipment, preparation of metals for enameling, types of application of enamel, creating the design, firing, finishing, soldering, problems brought about by cracking, blistering, and the like.

The brochure also contains a handy glossary and a bibliography.

Diesel Locomotives — Mechanical and Electrical Fundamentals

By John Draney. Cloth, 344 pp., 5½ by

(Continued on page 37A)

Shown above, the newly announced Kodascope Pageant Sound Projector, Model 7K2...one of six brilliant Pageant models.

They'll be in high school before this Pageant Projector needs a single drop of oil

All Kodascope Pageant Sound Projectors are *permanently* pre-lubricated at the factory, *never* need oiling. And this means that the major cause of 16mm. projector breakdowns–under- or over-oiling–is completely eliminated. It means longer life, too–*without maintenance.*

And when you buy a projector, you also want one that delivers the sharpest screenings and finest sound possible.

A built-in "field-sharpening element," for example, assures *sharp* focus over the *entire* picture area. It does this by eliminating the field curvature existent in all conventional projection lenses.

Sound "focusing" is another *exclusive* Pageant feature. A built-in Fidelity Control lets you precisely focus the scanning beam for crisp, clear sound from any 16mm. optical sound track–regardless of its position.

Comfortable sound–clear and adequate throughout the room–is no problem with a Pageant. This is because rated wattage is *deliverable* power . . . and because the speaker has ample capacity for the amplifier.

Quiet operation also makes the Pageant outstanding. Nylon gears help to make it quiet . . . and permanent pre-lubrication *keeps it quiet.*

To fit your 16mm. projection needs exactly, there are 6 different Pageant models, each tailored to meet special requirements . . . such as overcoming sound difficulties in auditorium-size rooms, combining extra sound power with easy portability, and teaming up added brilliance with added sound power. Be sure to look them all over at your dealer's, and then decide which one is best suited to your own needs. For the name of your nearest Kodak Audio-Visual Dealer, just mail the coupon.

What A-V experts say about Pageant pre-lubrication

"No doubt about it, the Pageant's permanent pre-lubrication *does* reduce wear and damage. There's always adequate lubrication to keep parts from wearing out . . . never an excess of oil to gum up operation."

Chris A. Bahnsen
United School Equipment Co., Omaha, Nebraska

"No wonder the Kodascope Pageant Sound Projector is gaining popularity so rapidly. Its exclusive pre-lubrication feature completely eliminates the possibility of under- or over-oiling . . . the primary cause of damage to 16mm. projection equipment."

Paul Rubenstein
Tampa Movie Center, Tampa, Florida

EASTMAN KODAK COMPANY 9-193
Dept. 8-V, Rochester 4, N. Y.

Please send name of nearest Kodak Audio-Visual Dealer and information on Kodascope Pageant Sound Projectors.

NAME_____
TITLE_____
ORGANIZATION_____
STREET_____
CITY_____ STATE_____
(Zone)

Kodak
TRADE MARK

New!

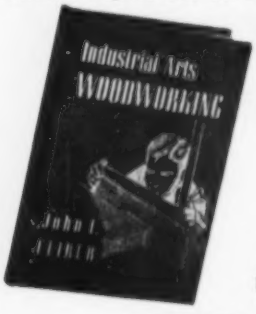
John L. Feirer's sensational new textbook . . . unmatched for instruction in power tools!

Texas state adopted

ADVANCED WOODWORK AND FURNITURE MAKING

The UP-TO-DATE textbook that coordinates teaching with the popular small-size power tools and MODERN furniture styles. Practical, clear and thorough coverage of design, planning, safety, care and use of machine and hand tools. Arranged logically and systematically.

HOW TO DO IT — reasons for procedures, processes, uses and care of tools and machines, safety regulations, etc. WHAT TO MAKE — literally hundreds of thought-starters. Contains 400 fact-filled pages (200 on power tools, with photos and instructions on uses, including jigs). Over 300 clear photographs . . . 81 idea-developing projects . . . all kinds of charts and drawings. . . . SAFETY stressed throughout. *Book No. 1 in coupon.* $3.96



INDUSTRIAL ARTS WOODWORKING

Hundreds of adoptions and a flood of endorsements are back of this best-known work of John L. Feirer. It's COMPLETE — meets every need of junior and senior high school classes from cutting out rough stock to finishing projects. Divided into 4 basic parts: (1) Fundamental processes of hand woodworking. (2) Basic machine tools. (3) Wood and wood products. (4) Genuinely interesting projects. . . . Examine a copy — *check No. 2 in coupon.* $2.88

ELEMENTARY TOOL DESIGN

New!

It's a FIRST because it's the only truly ELEMENTARY book on the subject! For students with prior knowledge only of mechanical drawing and machine shop practice, it avoids technical discussions and develops progressively. Provokes thought . . . stimulates design qualities. Examine a copy of E .B. Benson's new book. *Book No. 3 in coupon.* $4.76

ART OF TILE SETTING

New!

Another FIRST . . . the only "do-it-yourself" of tile-setting! Covers basic education, technical education, manipulative skills, physical ability, color harmony and artistic arrangement. Explains various types of tile and their qualities. . . . Includes coverage on sand, cement, limes, tar paper, metal lath, tools, and safety. By Carls and Wines. *Book No. 4 in coupon.* $3.75

MAKING THINGS OF PLASTIC

New!

A "goldmine" of ideas in plastic work! Complete coverage of this fascinating craft — shaping and filling, laminating in Plexiglas, cutting, molding, engraving, etc. Includes La Bounty's *new* 2-ply laminating process. Project suggestions and plans are selected from national award winners and commercial manufacturers of outstanding plastic craftwork. By Edwards. *Book No. 5 in coupon.* $3.75

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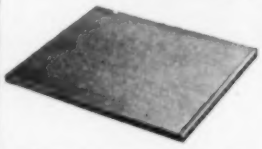

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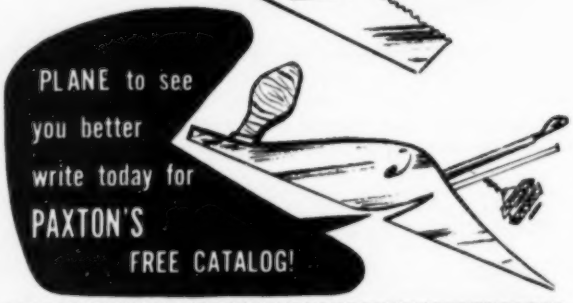

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NEW PUBLICATIONS

(Continued from page 34A)

8½ in., illus., $4.85. American Technical Society, Chicago 37, Ill.

This text combines what was previously contained in two books — *Diesel Locomotives — Mechanical Equipment*, and *Diesel Locomotives — Electrical Equipment*. The material has been thoroughly revised and brought up to date.

It presents to the reader the combustion principles in modern high-speed Diesels, explains fuel injection nozzles and pumps, lubricating systems, governors, super-charging and turbo-charging, air filtration, current electricity, generator principles, basic motor principles, Ohm's law, electric power measurements, transmission equipment, and primary and storage batteries.

All About House Wiring

By Floyd Mix and E. C. Pritchard. Cloth, 176 pp., 6 by 8¾ in., illus., $2.50. Goodheart-Willcox Co., Inc., Chicago, Ill.

This how-to-do-it book tells how to judge whether a house needs additional wiring, and also when existing wire is overloaded.

It gives explicit directions for installing wiring in new and existing houses; describes the materials needed; splices and connections, installing outlets, switches, etc.; how to figure requirements; how to lay out remote control systems; signal and communication systems; modernizing electrical systems, etc.

The Hand Produced Book

By David Diringer. Cloth, 603 pp., 6⅛ by 9¼ in., illus., $15. Philosophical Library, Inc., New York, N. Y.

This stupendous study attempts to trace the art of recording human events and happenings for posterity from the earliest oral traditions, the Old Stone Age cave drawings and paintings, primitive writing materials, etc., and the writings of the old ecclesiastics, down to the modern day examples of the printer's art.

Chapter Two of the book gives very interesting examples of pictograph systems of writing, and sound writing from which came our alphabet.

Chapter Three presents writing as it was used on clay tablets which show that some of these early peoples anticipated the Romans in the legal field by two thousand years.

Papyrus books form the subject of the fourth chapter from which can be traced the knowledge some of these ancient peoples had of astronomy, mathematics, and other subjects.

Chapter Five presents an interesting account of how books were written on leather or parchment.

Greek and Latin book production forms the content of the sixth chapter.

Chapter Seven describes the extensive use made of the written word by religion, while chapters eight, nine, and ten describe how the book developed in the outlying regions, and then discusses the Anglo-Celtic contributions to the development of the medieval book.

The final chapter discusses inks, pens, and other writing tools.

The book also contains quite an extensive bibliography.

Bibliography of Books and Published Reports on Gas Turbines, Jet Propulsion, and Rocket Power Plants

By Ernest F. Fiock and Carl Halpern. Supplement to National Bureau of Standards Circular 509, 110 pp., 50 cents. Order from Government Printing Office, Washington 25, D. C.

Rapid progress in the fields of gas turbines and jet propulsion has resulted in greatly increased literature covering the subject and also in a demand for co-ordination and exchange of relevant scientific knowledge. To cope with this demand and to enable the scientist or engineer to select with ease articles of specific interest, the National Bureau of Standards has issued this bibliography.

The original bibliography contains a brief introduction on the classification and rating of jet engines and includes references on the status and future prospects, theory, and performance, materials and construction, and research programs in the gas-turbine and jet-propulsion fields. Some references are also given to papers on applications of nuclear power in this field.

Yearbook III of the American Council on Industrial Arts Teacher Education

Cloth, 200 pp., 6¼ by 9¼ in., $4. McKnight & McKnight Publishing Co., Bloomington, Ill.

This yearbook presents three able discussions on subjects that are of great importance in any field of education.

The first of these discussions is on "Leadership." The author of this study is Dr. Roy F. Bergengren, Jr., assistant professor, industrial arts and vocational education, University of Florida, Gainesville, Fla.

The second deals with an equally important and far-reaching subject, "Techniques of Selection and Guidance of Graduate Students."

(Continued on next page)

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NEW PUBLICATIONS

(Continued from previous page)

It is written by Dr. George F. Henry, professor and head, industrial arts department, Colorado Agricultural and Mechanical College, Fort Collins, Colo.

The third presents the very complex problem of textbook emphases. The author of this analysis is Dr. Talmage B. Young, chairman, division of industrial arts, Berry College, Rome, Ga.

These three divisions together make a book that ought to be on the shelf of every institution preparing industrial-arts teachers and teachers of vocational subjects.

Printing and the Allied Trades

By R. Randolph Karch. Cloth, 318 pp., 5½ by 8¼ in., illus., $3.50. Pitman Publishing Corp., New York, N. Y.

This is the third edition of this text and it has been thoroughly revised.

It presents a brief history of printing, explains all about modern printing, foundry type, spacing material, straight composition, proving and correcting, distribution, layout, display composition, commercial printing, mechanical typecasting, lock-up and imposition, printing presses and plates, duplicate printing plates, ink and color, copperplate engraving, lithography, collotype, gravure, paper, and accident and health hazards.

Machine Tool Operation Part II

By Henry D. Burghardt and Aaron Axelrod. Cloth, 677 pp., 6 by 8¼ in., illus., $5. McGraw-Hill Book Co., New York 36, N. Y.

This is the third edition of this well-known machine-shop text.

Part II contains clear and well-illustrated descriptions of the shaper, planer, milling machine, grinding machine, hydraulics, metal band saws, metallurgy, and cutting fluids.

An operation sheet and a set of questions accompany each description given.

Veneering Made Easy for School and Home Workshop

By Herman Hjorth. Cloth, 103 pp., 5¾ by 8$\frac{11}{16}$ in., illus., $1.95. Albert Constantine and Son, Inc., New York 54, N. Y.

The author, a master craftsman and teacher who has written many technical books on woodworking for schools, here presents a book which gives the history of veneering, the advantages of using veneers, the methods of using them, types of veneers, the glue used, the making of the core and crossbands, how to glue veneers, making curved work, veneering wood with metals and other materials, and finishing veneered work.

Students, home craftsmen, and professional cabinetmakers will gain a great deal by a study of this book.

Carpentry, Joinery, and Woodcutting Machinery

By W. E. Kelsey. Cloth, 596 pp., 6 by 8¾ in., illus., $10. St. Martin's Press, New York 17, N. Y.

The author of this book has spent more than a quarter century in teaching carpentry and joinery in England. He also has served as examiner and as a member of advisory boards for technical examination councils and technical institutes.

The book discusses the tools and appliances used by carpenters, timber, joints and fastenings, hardware, details of buildings, temporary work, formwork, applied geometry for the carpenter, woodworking machinery, and mensuration.

Furniture Antiques Found in Virginia

By Ernest Carlyle Lynch, Jr. Cloth, 95 pp. 8⅝ by 11¼ in., illus., $3.50. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

A most delightful book for those who like beautiful old furniture.

It is written by a master craftsman who has made cabinetmaking a vocation and an avocation. He also has taught school and in that way has implanted the love of owning and/or making fine furniture into the hearts of many of his students.

The book contains measured detail drawings, with bill of materials, half-tone illustrations, descriptions, and directions for making 33 examples of fine furniture still in use in Virginia homes.

Handy-Quik Tolerances

By Alexander Michael, Sr. Paper, 4 by 5$\frac{5}{16}$ in., 96 pp., $1. Published by Handy Length Book Co., 3507 17th St., S.W., Canton, Ohio.

A useful, pocket-size booklet, prepared for draftsmen, designers, engineers, and tool and die men. It is divided into three parts: Part I contains fractional dimension tables commonly used in industry; Part II contains tables of ten-thousandth decimal dimensions; and Part III contains a table useful for precision work and for decimal tolerance, and for adding and subtracting whole numbers. A fourth section is devoted to learning industrial fractions and decimal equivalents.

(Continued on page 41A)

General Electric announces new line of high-accuracy portable d-c instruments

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Further information about General Electric's new DP-11 and DP-12 instruments may be obtained from your nearest G-E Apparatus Sales Office, or write for bulletin GEC-979, General Electric Co., Section 688-2, Schenectady 5, N. Y.

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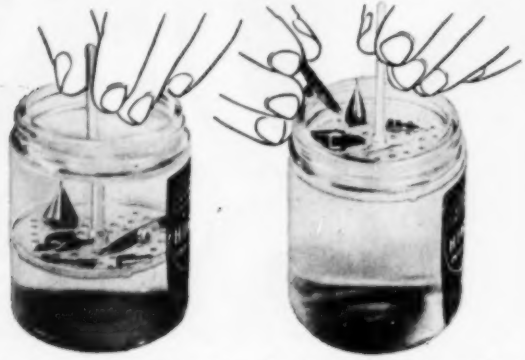

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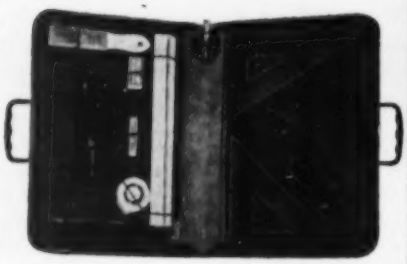

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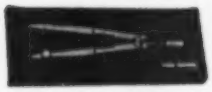

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NEW PUBLICATIONS

(Continued from page 38A)

101 Alphabets

By W. Ben Hunt and Ed. C. Hunt. Cloth, 192 pp., 6¾ by 9 in., illus., $3.75. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

This manual of lettering presents over 100 complete styles of alphabets which should be very helpful to students, artists, designers, and advertising men.

The authors are commercial artists and many of the alphabets in this new book were developed by them as they needed them in their daily work.

The new book *101 Alphabets* supersedes the earlier *Sixty Alphabets* and with the additional forty new alphabets will present a valuable reference to all who are interested in freehand lettering.

Creative Mechanical Drawing — Basic

By Oval S. Harrison. Paper, 89 pp., 8½ by 10¾ in., illus., $1.75. American Technical Society, Chicago 37, Ill.

This book for the beginner in drafting starts out with lettering exercises, then introduces the student to the important phase of dimensioning, applying geometry to mechanical drawing, using symbols, orthographic projection, pictorial drawing, sections and auxiliary views, sheet-metal developments, and special student-interest problems.

The Supervision of Industrial Arts

By William A. Bakamis. Cloth, 219 pp., 5¾ by 8¾ in., $3. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

This book gives a clear, full presentation of the philosophy, techniques, and procedures of industrial-arts supervision.

It is addressed to supervisors of industrial arts and supervisors of education, as well as to teachers who are preparing for or anticipating promotions to positions such as heads of departments or supervisor.

The book deals with development, organization, qualifications of supervisors, duties, classroom visitation, selection of teachers, improvement in service, conferences, demonstration teaching, bulletins, evaluation, planning supervision as applied to the industrial-arts field.

Chapters on shop supply management and planning expansion are slanted especially toward industrial arts. Each of the sixteen chapters is followed by selected references for further reading.

Heat Treating Aluminum Alloys

Ring-bound, 122 pp., 6 by 9 in., illus., $1. Issued by Reynolds Metals Co., Louisville 1, Ky.

Metallurgy involved in the heat treatment of aluminum alloys is covered in a simplified, nontechnical, easily understood form in this new manual.

Section Two is written for the metallurgist. Here will be found full metallurgical details on the wrought aluminum alloys, the cast aluminum alloys, the wrought alloy numbering system, and the temper designation system. Both heat-treatable and nonheat-treatable aluminum alloys are covered.

Section Three presents in tabular form complete technical processing data with recommended times and temperatures.

Living Crafts

By G. Bernard Hughes. Cloth, 192 pp., 5⅜ by 8 in., illus., $4.75. Philosophical Library, New York, N. Y.

There are numerous craftsmen who are working at trades that have changed but little for centuries. The author has written up twenty of these. The illustrations have, in the main, been well chosen. They generally show how the ancient and the modern craftsmen performed similar operations.

The crafts described are: clay tobacco pipe maker, gold-beater, silversmith, pewterer, wire-drawer, textile printer, carpet-maker, rope-maker, wood-turner, cooper, basket-maker, bow and arrow makers, charcoal-burner, paper maker, paper-marbler, parchment maker, products made of horn, fireworks-maker, glass-blower, and soap-boiler.

Welding Aluminum

By Charles B. Reynolds. Spiral binding, 186 pp., 5¾ by 8½ in., illus., $1. Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

This is a new and greatly enlarged edition of the manual by the same title previously published by Reynolds. The new edition contains material on 34 processes suitable for welding, brazing, and soldering aluminum and its alloys. These processes are shown in a large chart revealing their relation to one another and indicating those processes most widely used.

A second chart breaks down the wrought aluminum alloys and shows the various joining methods suitable for the various alloys. A third chart covers the aluminum casting alloys in a similar manner.

(Continued on next page)

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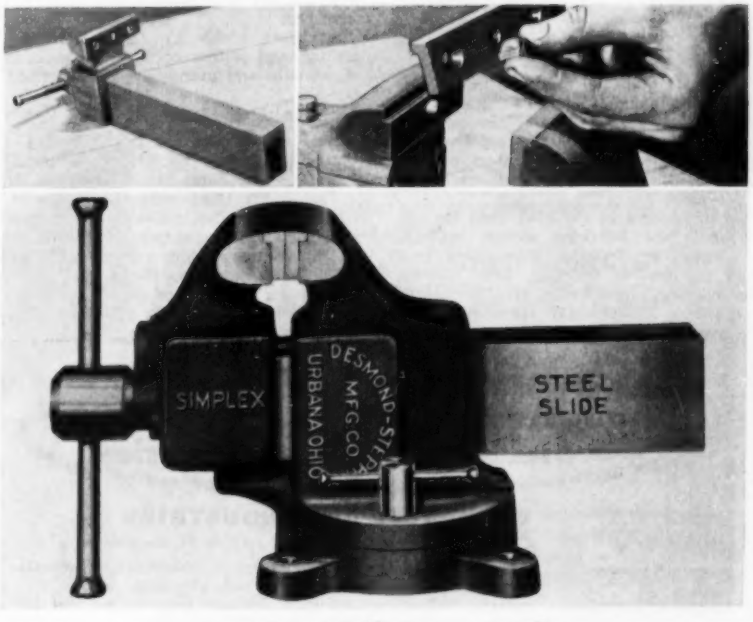

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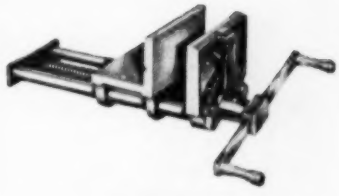

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NEW PUBLICATIONS

(Continued from previous page)

Detailed weldability ratings for the wrought alloys and casting alloys are presented in tables rating them for gas, arc, and resistance welding processes as well as for brazing and soldering.

The factors that give the aluminum alloys their particular welding characterictics are explained, and definitions of the 34 welding, brazing, and soldering processes are included.

Flow welding, stud welding, and induction welding are other comparatively new processes described in the manual.

Another new development that has created much interest recently is "cold" welding — one of the two methods of "pressure" welding discussed in the Reynolds manual.

Drawing, Sketching, and Blueprint Reading

By Shriver L. Coover and Chris H. Groneman. Cloth, 377 pp., 7½ by 10⅛ in., illus., $3.96. McGraw-Hill Book Co., New York 36, N. Y.

A text for students, grades 7 through 12. It covers a number of areas of drawing, all of them presented with examples of good drawing. The authors are using the term multiview projection in place of orthographic projection. One feels like congratulating them on this move.

The six sections of the book treat the subject under the following section headings: introduction to drawing, interpreting blueprints and making drawings, basic information (lettering, dimensioning, etc.), application of drawing, occupational information, and useful information for draftsmen. The book also contains a list of visual aids.

The blueprint reader's dictionary will be welcomed by many users of this text.

Patternmaking and Founding

By Robert E. Smith. Paper cover, 111 pp., 7¾ by 10¼ in., illus., $1. McKnight & McKnight Publishing Co., Bloomington, Ill.

An excellent, well-illustrated text from which the student can get a good idea of what the patternmaker and the foundry worker must do and how they must cooperate to perform their important part of the work demanded by our modern industrial age.

The book also contains very fine examples of related work about aluminum, aluminum alloys, antimony, copper and copper alloys, iron and steel, wrought iron, lead, tin, and zinc.

The book contains 35 units. One of them is devoted to the technical terms used by the patternmaker. Other units describe how to make simple, split, and built-up patterns. The method of making core boxes also is described.

Ramming molds by hand and machine, making and setting cores, and the handling of furnaces and ovens, also are described.

Mechanics of Materials

By Philip G. Laurson and William J. Cox. Cloth, 414 pp., 6 by 9¼ in., illus., $5.75. John Wiley & Sons, Inc., New York, N. Y.

This is the third edition of this text designed to give the technical and engineering students a clear conception of the principles which underlie machine and structural design.

The book introduces the student to an understanding of stress and deformation, properties of materials, stresses, pressure containers, axial loads, torsional stresses, design of beams, restrained beams, direct stresses combined with bending, columns, with axial and eccentric loads, combined stresses, elastic energy, continuous beams, beams of two materials, and eccentrically loaded connections.

The book contains numerous problems for practice, and the appendix presents material on centroid of areas, the moment of inertia of a plane area, and a number of very helpful tables.

Summaries of Studies in Agricultural Education — Supplement No. 7

Office of Education Vocational Division Bulletin No. 253, Agricultural Series No. 64, 75 pp., 30 cents, 1954. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

In 1935, the research committee of the Agricultural Education Section of the American Vocational Association initiated a project to make summaries of agricultural education studies available. The result of this project was the publication of *Summaries of Studies in Agricultural Education*, Office of Education Vocational Education Bulletin No. 180. This new publication is Supplement No. 7 to Bulletin No. 180.

It includes summaries for 156 studies, 24 of which represent nonthesis studies conducted by professional workers on the supervisory or teacher-training staffs in the several states. Fourteen are summaries of doctoral dissertations. Forty-one are research problems, other than theses, completed in partial fulfillment of the requirements for master's degrees. The remaining 77 are summaries of theses written as part of the work for M.S., M.Ed., or M.A. degrees.

Definitions in Vocational and Practical Arts Education

American Vocational Association, Inc., 1010 Vermont Ave., N.W., Washington 5, D. C. Single copies 25 cents; five for $1.

This booklet will help to clarify educational terminology. It was prepared by the AVA Committee on Research and Publications. The glossary is offered to educators and laymen with the hope that it may be of service in resolving the confusion existing in the use of educational terminology.

Careers for English Majors

By L. Ruth Middlebrook. Paper 27 pp., 6 by 9 in., 25 cents. New York University Press, New York 3, N. Y.

A list of possibilities for college students who have majored in English. Among these are teaching, writing, and editing. But there are other openings for the English major as well. Among these are research, and personnel opportunities in industry, business; and local and federal offices, social service, and many others.

Free and Inexpensive Learning Materials

Paper, 216 pp., 5½ by 8½ in., $1. Division of Surveys and Field Services, George Peabody College for Teachers, Nashville 5, Tenn.

This is the sixth edition of this helpful list of teaching aids.

Your Stake in Social Security

By Arthur J. Altmeyer. Paper, 28 pp., 5¼ by 7⅛ in., 25 cents. Public Affairs Pamphlet No. 206. Public Affairs Committee, 22 East 38th St., New York City.

An explanation of what and for whom social security is attempting to do something.

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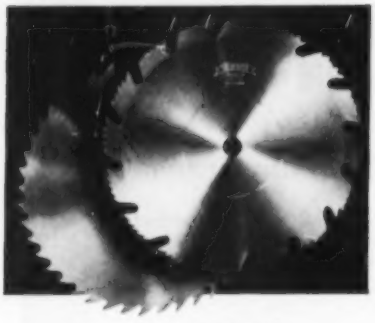
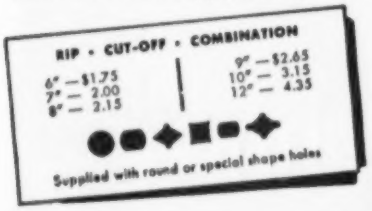
Get More Out of Your Power Saw



with SIMONDS SI-CLONE SAWS

To make the most of any power saw you need more than one type of blade. Simonds makes 13 different types — a type for every purpose: ripping, cutting-off, mitering, grooving, metal cutting, etc. Sizes up to 12" diameter to fit any machine. Now at popular prices — carrying the full Simonds *Guarantee*. Get these edge-holding, fast cutting saw blades at your local hardware or mill supply dealer.



GUARANTEE — Made of Simonds steel fully guaranteed against any defect in material or workmanship.

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon, Canadian Factory in Montreal, Que.

SHOP EQUIPMENT NEWS

(Continued from page 56A)

Developed for school use, it is also available as an accessory to Shopsmith Mark 5 owners who want the ultimate in safety. A window in front permits watching the work. Shopsmith Mark 5 is the only home power tool built to industrial safety standards with no hazardous exposed belts or pulleys.

For full information write to *Magna Engineering Corp., Menlo Park, Calif.*

(For Convenience Circle Index Code 0716)

SPECIAL FISHERMEN'S PLIER

PROTO fisherman's plier is made expressly for fishermen and other sportsmen.

The long slim jaws of the 6-in. plier are suitable for extracting stubborn hooks from fish, attaching sinkers, fastening either wire or nylon leaders, making flies, and skinning fish. Sharp, induction-hardened side cutters are handy for cutting steel leaders, line, etc. The entire plier is useful for repairing reels, outboard motors, and other sports equipment.

Proto Fishermen's Plier

Heavy copper-nickel-chrome plating prevents rust from moist air, wet hands, and even salt water.

The plier is enclosed in a saddle leather sheath designed for wearing on a belt, and has a button strap to prevent loss.

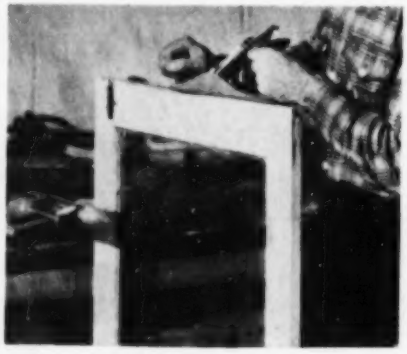
The sheath and plier combination is known as No. 221A.

For further information write to *Plomb Tool Company, 2204A Santa Fe Ave., Los Angeles 54, Calif.*

(For Convenience Circle Index Code 0717)

NO. 72½ COLUMBIAN GYRO-VISE

The manner in which the new Columbian Gyro-Vise No. 72½ operates on its side from a standard base is illustrated in the accompanying illustration.



No. 72½ Gyro-Vise

This vise works equally well in any *upright* or *on-its-side* position. It rotates in a full circle and locks automatically when its jaws are tightened.

Gyro-Vise jaws are 2½ in. wide and 4¼ in. deep. Maximum jaw opening is 5 in.

For further information address *The Columbian Vise & Mfg. Co., Fidelity Bldg., Cleveland 14, Ohio.*

(For Convenience Circle Index Code 0718)

Descriptive Material

McGRAW-HILL TEXT-FILMS

McGraw-Hill has produced three films for use at junior and senior high school levels to encourage discussions of basic social and moral questions coming within the general category of good citizenship. Primary for guidance, civics and citizenship classes, these films will also prove valuable for informal discussion in teen-age club and church groups, as well as adult groups interested in the topic.

They are entitled: One Man's Opinion — 6 min.; The Majority Vote — 7 min.; and The Honest Truth — 5 min.

For further information write to Text-Film Department of *McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y.*

(For Convenience Circle Index Code 0719)

DRAWING INSTRUMENT BOOKLET

A 32-page booklet, featuring the new Post line of drawing instrument sets and accessories, serves as an ideal reference for instructors of mechanical and architectural drawing. Colorfully illustrated, it describes in detail multiple combinations of drawing instruments that may be selected to suit individual requirements.

For your copy write the *Frederick Post Company, Box 803, Chicago 90, Ill.*

(For Convenience Circle Index Code 0720)

NEW BOOKLET ON SCREENS

The Aluminum Company of America has just published a new Alcoa booklet, titled "Things You Should Know About Screens of Alcoa Aluminum."

Step-by-step instructions and diagrams are given for replacing worn-out screening with long-lasting aluminum screen cloth in woolen and metal frames of all types.

Copies may be secured from *Aluminum Company of America, 735 Alcoa Bldg., Pittsburgh 19, Pa.*

(For Convenience Circle Index Code 0721)

BULLETIN DESCRIBES NIAGARA PUNCH AND SHEAR

New Bulletin 79-B, just published by Niagara Machine & Tool Works, describes the new Niagara No. 5-24 Deep Throat Hand Lever Punch and Shear. Action photos demonstrate the versatility of the machine in performing punching, notching, and shearing operations.

A copy of Bulletin 79-B can be obtained by writing to *Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y.*

(For Convenience Circle Index Code 0722)

(Continued on page 47A)

HAMILTON

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By Dragoo & Porter. Recently revised. Beginner's test in practical electricity, in short teaching units with basic information. Amply illustrated. Projects include radio construction and usable home appliances. $1.25

 # 30 GENERAL SHOP METALWORK

By Dragoo & Reed. Basic text for beginning metalwork. 28 projects include bench metal, sheet metal, art metal and ornamental metalwork. 104 pages. $1.25

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By Fryklund & Kepler. A textbook for the first year of drafting. 430 illustrations included. Easy to read. $1.25

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By Glen U. Cleeton & Charles W. Pitkin. Revised 1953. 10 NEW units. Explains printing procedures, equipment, design, etc. $3.00

 # 60 GRAPHIC ARCHITECTURAL DRAFTING

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Drawn and Lettered with FB-C and D-- Speedballs in Speedball inks

DESCRIPTIVE MATERIAL

(Continued from page 44A)

NEW ATF TYPE FACES

Three new type faces have been added to the American Type Founders line of foundry types.

Brody was designed to make available in type a much used, popular style of freehand display lettering. It is cast on a regular square body, and has no fragile kerns. This brand-new face provides the appearance of authentic hand lettering at only a fraction of the cost.

Dom Bold is new, too. Dom Casual was ATF's best seller to 1953. It found immediate acceptance and was used well. But many felt that it could absorb more weight for extra emphasis. So Dom Bold, casual, was the answer.

Franklin Gothic Wide is a recent addition to the Franklin Gothic family. Sizes 6, 8, 10, and 12 point, just added, are remarkably legible body sizes in blocks of copy and captions.

Steelplate Gothic Bold, in 30 and 36 point sizes, has been revived to satisfy a widespread demand for a larger companion for the Copperplate Gothics.

A folder just published by ATF displays these faces. Send for your copy, addressing your inquiry to Advertising Department, *American Type Founders, 200 Elmora Ave., Elizabeth, N. J.*

(For Convenience Circle Index Code 0723)

NEW AIRCO HELIWELD CATALOG

A new 16-page catalog is being offered by Air Reduction covering in detail features of the Heliwelding process and the equipment used with it.

The catalog fully describes and illustrates in actual welding operation, the manual holders either air- or water-cooled, light or heavy duty water cooled machine holders for use with the semiautomatic equipment, and the automatic head that can be used with the Heliweld process. The automatic hardfacing process using vibratory feeder is also shown.

Request a copy of the catalog, ADC 709B, by writing to *Air Reduction Sales Company, 60 East 42nd Street, New York 17, N. Y.*

(For Convenience Circle Index Code C724)

ELECTRIC GLUE POTS

A new catalog featuring electrically heated glue pots and tanks, together with a description of heaters for the various new synthetic resin adhesives, has recently been published by Sta-Warm Electric Company.

The folder describes the various capacities of Sta-Warm deep and shallow models of bench glue pots, semiportable large tank heaters, and accessories which are offered.

For further information, address *Sta-Warm Electric Co., Ravenna, Ohio.*

(For Convenience Circle Index Code C725)

SOUTH BEND 10-in. LATHES

The South Bend Lathe Works has published an illustrated folder which thoroughly describes their new improved 10-in. lathes, with 24 spindle speeds, micrometer dials, new machine handles, and gear box.

For your copy, write to *South Bend Lathe Works, 425 East Madison St., South Bend 22, Ind.*

(For Convenience Circle Index Code C726)

TEACHING MATERIALS

American Iron and Steel Institute has available a bibliography of reference and audio-visual materials on iron and steel which schools and colleges have found useful. It has been assembled in "A Teachers' Guide to Industry-Produced Reference and Audio-Visual Materials on Iron and Steel."

For a copy of this booklet write to *American Iron and Steel Institute, 350 Fifth Ave., New York 1, N. Y.*

(For Convenience Circle Index Code 0727)

HARDENING AND DRAWING FURNACES

Surface Combustion Corporation recently released a new bulletin SC-164 on their complete line of furnaces for hardening and drawing or tempering operations.

Included in this two-color bulletin are direct-fired and controlled atmosphere furnaces of both the batch and continuous types.

A handy table on the back page provides data on the hardness achieved at specific drawing temperatures for the most common steels.

For copies of bulletin SC-164 write direct to the *Advertising Department, Surface Combustion Corp., Toledo 1, Ohio.*

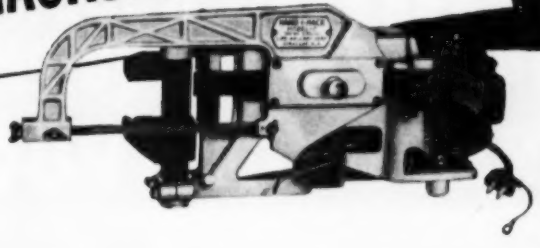
(For Convenience Circle Index Code 0728)

EASTERN HANDICRAFTS CATALOG

Schools and club groups will find descriptions and illustrations of tools and materials for leathercraft, ceramics, enameling and jewelry, tile and glass painting, tile and woodenware decorating, decorative plastics and lamp-

(Continued on next page)

Stop HACKSAWING by Hand!



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HAND-I-HACK* portable power hack saw

Cuts at any angle up to 45°.

Cuts 3" square steel bar.

HAND-I-HACK eliminates the sweat and unproductive cost of manual hacksawing. Rugged—light in weight—Hand-I-Hack can be carried anywhere in the shop to cut bar stock, angle iron, flexible metal tubing, thin-wall tubing—even 4" I-beams.

Attached to the work, it saws in any position: horizontal, vertical, angular, *upside down*. One-quarter HP motor plugs into wall socket. Motors available for all standard circuits.

Cuts are accurate –saves stock. First cost is low —operating and upkeep cost negligible. Another saving: uses low-cost high speed *hand blades*.

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Manufacturers of Automotive Clutches and Machine Tools
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DESCRIPTIVE MATERIAL

(Continued from previous page)

shade supplies, candlecraft, basketry, etc., in the new edition of the 1954 Catalog Buying Guide, a 96-page pocket-size catalog, published by *Eastern Handicrafts, Room 39, 151 Spring St., New York 12, N. Y.*

(For Convenience Circle Index Code 0729)

NAME TWO WINNERS OF SCHOLARSHIPS

Two winners have been named for the annual Atlas Press Company scholarships in industrial arts at Western Michigan College.

They are: Robert H. Petersen, Escanaba, Mich., high school, a student of Ray C. Shaw; and James Sylvester, Bay City, Mich., high school, a student of J. Morley Dixon.

Annually the Atlas Press Company, manufacturers of Atlas wood and metalworking power tools and clausing machine tools, offer two scholarships to help stimulate interest in industrial arts and to help raise the caliber of the oncoming industrial-arts teacher. The awards total $500 each, $200 for the freshman year, and $100 a year after that.

The selection of these two students was made from 12 finalists who were guests of the Atlas firm for a day in Kalamazoo. The awards were based on craftsmanship, scholarship, and personality. Judges were Morris Overholt, industrial-arts instructor at Grand Haven; E. C. Weaver of the faculty of the Western Michigan College of Education; and Flateau Allen, director of the educational division of Atlas.

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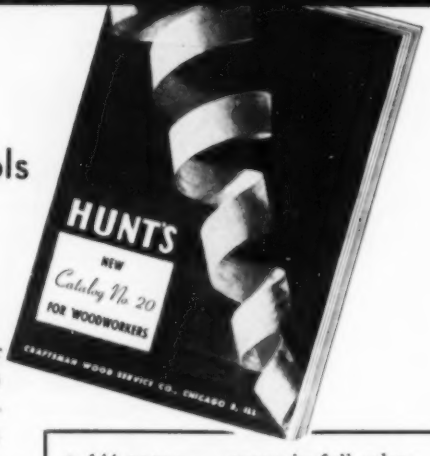

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Business and Personal News

D. F. McCANDLISH APPOINTED REGIONAL MANAGER

D. F. McCandlish, manager of the Air Reduction Sales Company district office in Chicago, was appointed regional manager of the North Central Region in Chicago. Mr. McCandlish succeeds S. H. Newburn who was recently appointed president of Air Reduction Canada Limited.

Mr. McCandlish joined Airco in 1931 as a salesman in the Los Angeles District. Later he became assistant manager and then manager of the Oklahoma City office. In 1941 Mr. McCandlish was appointed manager of the Chicago district.

S. S. Bruce, Jr., formerly zone manager, eastern region of the Air Reduction's Railroad Department, succeeded Mr. McCandlish as Chicago district manager.

S. H. NEWBURN NAMED PRESIDENT

S. H. Newburn has been appointed president of Air Reduction Canada Limited.

Mr. Newburn joined Air Reduction in 1936 and since then has held various sales and management positions ranging from salesman at Cleveland to District Sales Manager in Detroit. In 1950, he was appointed regional manager of the North Central Region of Air Reduction Sales Company with offices in Chicago, a post he has held until the present time.

He will be located in Montreal, headquarters of Air Reduction Canada.

D. F. McCandlish, Chicago district manager, succeeds Mr. Newburn as regional manager.

APPOINTED SECRETARY-TREASURER

Robert J. Sutton has been appointed treasurer and secretary of Atkins Saw Division, Borg-Warner Corporation, Indianapolis. Ellery Levitts has been made assistant treasurer and Howard O. Wiesen assistant secretary.

Sutton joined the saw company in 1947. He was formerly assistant secretary-treasurer.

EDWARD H. WEITZEN IN CHARGE OF MARKETING

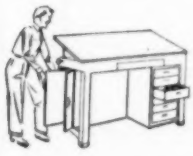
Edward H. Weitzen, formerly vice-president of the Bulova Watch Co., Inc., and president and director of Bulova Research and Development Laboratories, Inc., has joined American Machine & Foundry Company as vice-president in charge of marketing.

He will be responsible for the planning, organizing, integrating, and controlling of all marketing functions for the company and its subsidiaries.

RIDER APPOINTS THREE NEW REPRESENTATIVES

Hoemig Sales Co., 1730 Clover Lane, Fort Wayne, 7, Ind.; Bob Miller Sales Co., 805 Eldorado, Clearwater Beach, Fla.; and Gene Piety, 2030 Home Rule St., Honolulu 17, Hawaii, have been appointed representatives of the Rider line of publications, respectively, for Indiana and Western Kentucky; Florida; and Hawaii.

John F. Rider, Publisher, Inc., 480 Canal St., New York, N. Y.



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Baked hammertone grey enamel finish. 37" high. Many board sizes. Also available with steel or hardwood tops. Write for catalog

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Paint Brush Conditioner

Designed for Shop Use

This new metal rectangular PROTEXEM Paint Brush Conditioner assures many years of service.

PROTEXEM'S Vapor Action has proved to be the best system for keeping brushes soft and ready for use for over 10 years.

You can put brushes away at the end of the day and they will be ready for use the next morning when class opens. A real time and brush saver.

Write for Information and Special School Price

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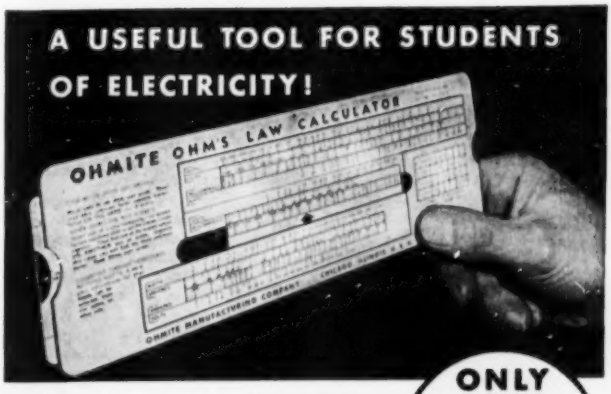
OHM'S LAW CALCULATOR AND SLIDE RULE



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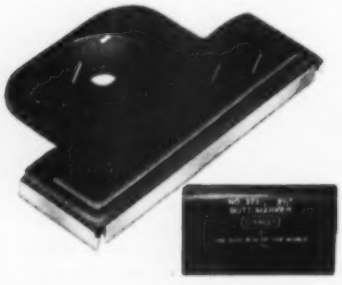
Shop Equipment News

NEW STANLEY BUTT MARKER

A new butt marker, designed to cut perfect mortises, is now being marketed by Stanley Tools, New Britain, Conn. Handy, and easy to use, the new butt marker has three cutting edges. Door and jamb are marked for the top of the hinge leaf. One



New Stanley Butt Marker

cutting end of butt marker is positioned on the line, with stops against the side of the door. Marker is then struck on each end, driving the three cutting edges to the desired depth. A press on the handle releases the tool. Mortise is completed by removing material with a chisel. Available in three sizes for standard butts: Nos. 373–3 in., 373½–3½ in., and 374–4 in., individually packed in a red plastic carrying case. Wood block permanently fastened in case protects cutting edges of tool.

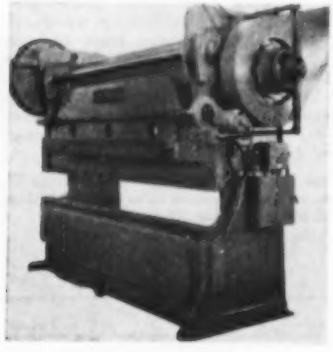
For further information write to *Stanley Tools, New Britain, Conn.*

(For Convenience Circle Index Code 0701)

NEW HIGH-SPEED ALL STEEL PRESS

The Cincinnati Shaper Company has produced a new high-speed all steel press which can be used for *high speed punching* and *automatic feeding applications*. This press brake operates at 70 strokes per minute and is equipped with a specially arranged ram.

The machine has an all steel rolled plate construction with an interlocked frame, push button control to the ram adjustment, micrometer indicators on both ends of the machine, centerline loading, weld free joints, and automatic pressure lubrication.



Steel Press Brake

For further information write to *The Cincinnati Shaper Co., Hopple, Garrand and Elam Sts., Cincinnati, Ohio.*

(For Convenience Circle Index Code 0702)

SHIELDED WELDING BENCH

A new series of arc welding benches with 36½ by 36½-in. tops that will stand without end or wall supports, has been introduced by Industrial Bench and Equipment Mfg. Co., Inc., of New Britain, Conn.

Shielded Welding Bench

Fitted with a 30 in. high glare shield on three sides, the new series of benches feature the exclusive Industrial Equipment design legs, electrically welded into formed sections. The bench surface is standard height (33⅝ in.). Arc welding benches come equipped with a bench drawer 18 by 22 by 5 in. and a shelf with partitions for holding welding rods. Not furnished as regular equipment, fire brick 9 by 4½ by 2¼ in. can be easily and conveniently installed on the top.

Choice of lock or padlock attachment is available for the theftproof steel drawer, which will not bind or cramp no matter how full.

For information write to *Industrial Bench and Equipment Mfg. Co., 98 South Street, New Britain, Conn.*

(For Convenience Circle Index Code 0703)

DeWALT SAFETY CARRIAGE LOCK

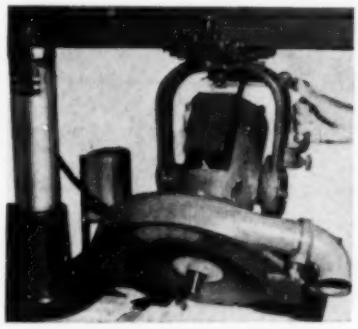
DeWalt Inc., subsidiary of American Machine & Foundry Co., has added an automatic safety lock to the carriage on which the cutting head of its radial arm machine rides.

The operator depresses the plunger with his thumb to allow the carriage to roll freely forward and back on its machined tracks. The instant the pressure from his thumb is released from the plunger, a positive lock goes into action, immediately stopping the motion of the carriage on which the cutting tool rides.

The lock also holds the carriage stationary when the machine is standing idle or when being used for ripping.

Provision has been made to instantly disengage the entire locking mechanism when the machine is being used in conjunction with a chain or screw cross-feed device.

The safety carriage lock will be available



DeWalt Safety Lock

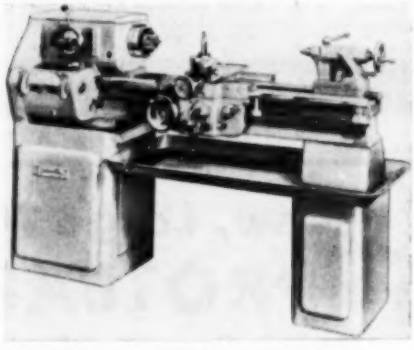
as optional equipment on all DeWalt Model GE, GA, and GW machines in the future.

For further information write to *DeWalt Inc., Lancaster, Pa.*

(For Convenience Circle Index Code 0704)

NEW 13-IN. SEBASTIAN LATHE

The new Sebastian 13-in. geared head lathe, featured by Sheldon Machine Company, is a rigidly built precision lathe that combines power with accuracy. Outstanding features include the large, heavy bed, tapered roller bearings supporting the spindle, and the large 1⅛-in. hole through the spindle.



New 13-in. Sebastian Lathe

All gears in the headstock run in oil, are extra wide, and designed for quiet, efficient operation. The enclosed gear box is large and has 60 different pitches and feeds. A lead screw reverse lever is incorporated in the gear box, easily accessible to the operator.

For further information write to *Sheldon Machine Co., Inc., 4258 N. Knox Ave., Chicago 41, Ill.*

(For Convenience Circle Index Code 0705)

ADJUSTABLE ELEMENTARY BENCH

Parent Metal Products recently announced the addition of a new Adjustable Elementary Woodworking Bench to their line of shop bench and storage equipment.

Over-all height of the bench can be adjusted to 24, 26, 28, or 30 in. by extending or lowering interlocking steel legs. Only one bolt need be adjusted in each leg to make height adjustment. This simplified adjustment feature permits this bench to be used for all elementary grades.

Bench is 42 in. long, 21 in. deep, and 1¾-in. laminated edge grain maple top is equipped with one elementary woodworkers' vise. Available with or without lower shelf of steel.

For information and complete industrial-arts and vocational equipment catalog, write

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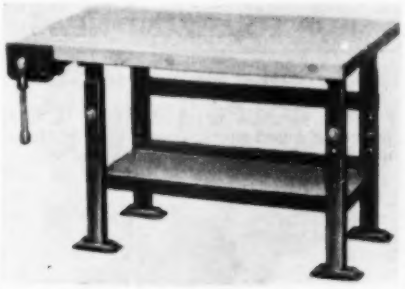
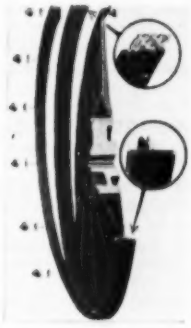


New Adjustable Woodworking Bench

Parent Metal Products, Inc., Dept. V-2, Fourth and Locust Sts., Philadelphia 6, Pa.
(For Convenience Circle Index Code 0706)

JIFFY TIRES FOR CARTER RIGID WHEELS

Carter Products Co., Inc., announces the installation of Jiffy Tires as standard equipment on all Carter Rigid Wheels, available in all sizes for any band saw. This new combination supersedes the 30-in., and 36-in. size Carter Quick Change Tire, in use since 1929, and provides the industry with greater than ever efficiency and economy in high speed, heavy-duty production.



Jiffy Tires

Jiffy Tires, from 14 to 36 in., are applied in approximately 10 minutes, requiring no glue, cement, or special tools.

The new Carter Jiffy Tire is molded with extreme precision so that replacement tires will balance without rebalancing the assembly.

Complete specifications for any make or size of band saw will be furnished on request to *Carter Products Co., Inc., Dept. W., 30 Ionia Ave. S.W., Grand Rapids 4, Mich.*
(For Convenience Circle Index Code 0707)

TYPE "R" CIRCUIT BREAKER

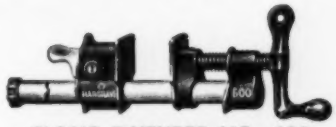
The Trumbull Components Department of General Electric Company announces the introduction of a new Type "R" Circuit Breaker for the residential construction market.

This new Type "R" Circuit Breaker provides modern protection for the modern home, and does away with the need for old-fashioned fuse boxes.

The Type "R" has a *trip indicating handle.* When a short circuit or an excessive overload trips the breaker, the handle moves to a mid-position between *on* and *off*, so that one glance shows which breaker is tripped. The circuit is closed by moving the handle to *reset* and then to *on*. Even if the handle is held on, *trip free contacts* will open under an

(Continued on next page)

Strength and Speed with HARGRAVE BAR CLAMPS



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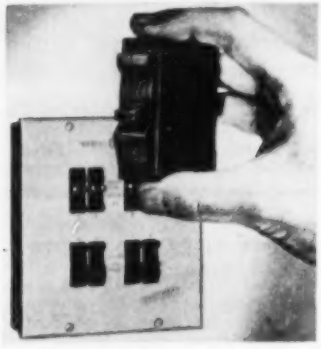
SHOP EQUIPMENT NEWS

(Continued from previous page)

excessive overload or short circuit. A new projecting guard protects the Type "R" handle. Thus, Type "R" is foolproof and safe.

A full line — 15, 20, 30, 40, and 50 amperes, 120 volts a.c., single pole — of G-E Type "R" Circuit Breakers is available immediately from GE Trumbull distributors throughout the United States.



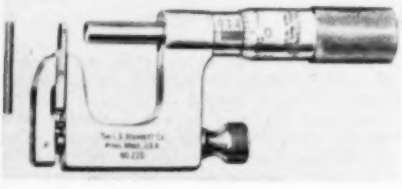
Type "R" Circuit Breaker

For further information write to *The Trumbull Components Department of General Electric Co., Plainville, Conn.*

(For Convenience Circle Index Code 0708)

NEW NO. 220 "MUL-T-ANVIL" MICROMETER

Because of the universal features possessed by this new patented Starrett micrometer, a wide variety of measurements impossible to obtain with regular micrometers may be made. This micrometer presents a brand new development and features multiple interchangeable anvils.

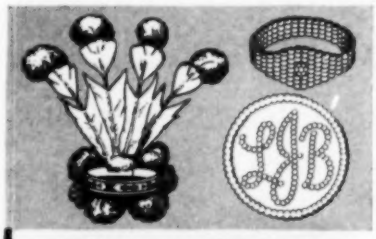


Starrett No. 220
Mul-T-Anvil Micrometer Caliper

Two anvils are furnished: a rod anvil approximately .120 in. diameter and a flat anvil .125 in., and .060 in. thick at opposite ends. The rod anvil is useful for measuring from a hole to an edge. With the flat anvil, distances from the inside of slots and grooves to an edge can be conveniently measured. Additional anvils of various shapes can be made by anyone and do not necessarily have to be hardened for occasional special jobs.

This new micrometer has a vise-type frame which holds the interchangeable anvils. The desired anvil is placed in the frame vise and after tightening the locking screw, the micrometer is ready for use. The micrometer can also be used as a height gauge by simply removing the clamping vise jaw.

The Mul-T-Anvil Micrometer has a range of 0 to 1 inch and reads in thousandths of an inch. It also features balanced design, no-glare satin chrome finish, hardened and



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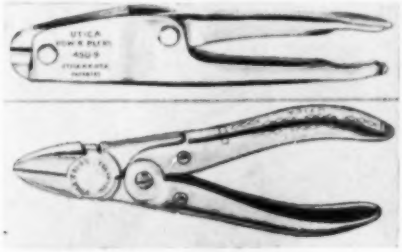
For further information write to *The L. S. Starrett Co., Athol, Mass.*

(For Convenience Circle Index Code 0709)

NEW UTICA HAND TOOLS

Utica Drop Forge and Tool Corporation has announced a new cam action, high leverage cutting pliers, which, though only 9 in. long, cuts up to ⅛-in. hardened steel drill rod.



New Hand Tools

Jaws of the new 450-9 are forged, extra hardened and hand honed. Handles are pressed steel.

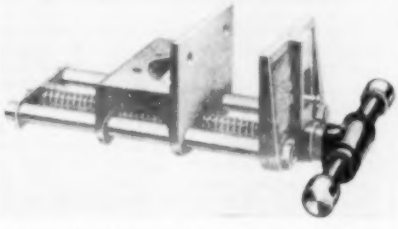
The firm also announces a new 5½-in. compound leverage action, diagonal cutting pliers. The cutters of this No. 441 have extra hardened forged jaws and hand honed cutting edges. The handles are steel stampings and are fitted with spring which opens the jaws automatically, thus being specially adapted to repetitive operations where the spring action reduces hand fatigue to a minimum.

For further information write to *Utica Drop Forge and Tool Corp., 2415 Whitesboro, Utica 4, N. Y.*

(For Convenience Circle Index Code 0710)

NEW STEEL HANDLE ON MORGAN VISES

The Morgan Vise Company of Chicago announces a change in the type of handle used on a majority of their woodworking vises. For many years a wooden handle has been standard equipment on woodworking vises.



New Steel Handle on Morgan Vises

Morgan Woodworking Vises will now use a heavy tubular steel handle that is far superior to the old style wooden handle. This new and improved handle will be furnished as a standard part on all Morgan Woodworking Vises, with the exception of Model 300A, without any additional cost. Wooden handles will still be available for those customers that specify wood handles. The new steel handle is 9⅞ in. long, ⅞ in. in diameter and threaded at each end to take special end

(Continued on next page)

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For preheating Methyl Methacrylate in sheet or rod form where it is necessary to maintain even temperature throughout the sheet, especially desirable in compressed air, vacuum or pressure forming techniques.

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No. 600

Due to the Aluminum Construction, the Oven is very light in weight and can be carried from room or project to project. As it operates on 110 volt AC or DC, it can be plugged into any 110 volt receptacle.

SPECIFICATIONS

Model	Interior Size	Wattage 110 AC-DC	F.O.B. Phila. Price
600	12"Wx12"Dx12"H	700	$ 75.00
602	24"Wx12"Dx12"H	1400	125.00

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SHOP EQUIPMENT NEWS

(Continued from previous page)

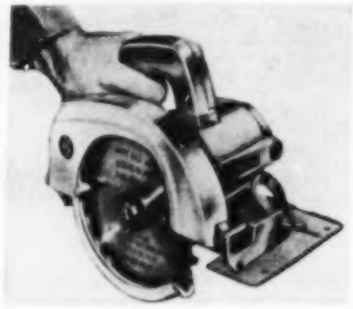
fittings and rubber washers that are furnished with the handle.

Morgan Vise Co., 112 North Jefferson St., Chicago 6, Ill.

(For Convenience Circle Index Code 0711)

NEW PORTER-CABLE POWER SAW

A powerful 6-in. electric handsaw with several new exclusive features has just been introduced by Porter-Cable Machine Co.



New Porter-Cable Power Saw

The new model 125 Homemaster Saw has kickproof clutch that eliminates the kickbacks or bucking. Two precision ball bearings on jackshaft and armature mean longer life and less repairs. A high speed 8-ampere motor drives the saw through the work at 3300 r.p.m.

Model 125 cuts 2-in. dressed lumber and permits adjustment of cutting depth and blade angle. An inexpensive steel table converts the portable Homemaster Saw in a moment into a precision table saw with calibrated angle gauge and adjustable rip fence. This compact lightweight saw weighs only 8 lbs., and measures 7½ in. long, 7⅝ in. wide, and 8½ in. high.

For complete description, and 44-page catalog of forty other electric tools, write *Porter-Cable Machine Co., 35 Exchange St., Syracuse 8, N. Y.*

(For Convenience Circle Index Code 0712)

MASTER LIQUID WHITE GLUE

The Kindt-Collins Company has announced a new, fine-quality white glue for use in pattern shops. It embodies exceptionally high standards of performance, stability, and long life. The trade name is Master White Glue.

In laboratory and shop tests, the new product has shown a high solid content that delivers good adhesive qualities and ease of use. It remains stable even when stored for long periods of time and is not affected by freezing.

It comes in one gallon flexible plastic bags that are in turn packed in one gallon cans to assure freshness, prevent contamination, and eliminates the breakage common to glass

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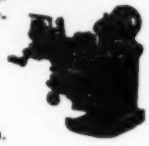

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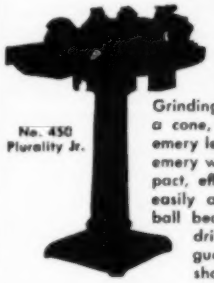
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containers. It is also available in plastic-lined five-gallon cans and in 54-gallon drums.

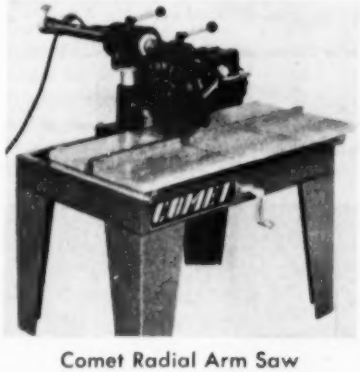
One-quart plastic Dispenso bottles, for dispensing glue, can also be obtained.

For further information write to *The Kindt-Collins Co., 12653 Elmwood Ave., Cleveland, Ohio.*

(For Convenience Circle Index Code 0713)

COMET RADIAL ARM SAW

Consolidated Machinery and Supply Co. recently made available a new model of their popular 1½ h.p. Junior Model Comet Saw. This new model has a number of design changes that will make the use of this improved saw even more safe, accurate, and easy to use.



Comet Radial Arm Saw

A new starting switch close to the pull handle is a very important safety feature. The machine now raises and lowers from the front, so there is no need to reach behind it to set it into position for making a cut. Each turn of the handle raises or lowers it 1/16 of an inch.

It also has a redesigned saw guard with antikickback dogs which is adjustable up or down, forward and back.

A new wider cutting table has been added, which is always clear to receive material because of the retractable arm.

For full information write to *Consolidated Machinery and Supply Co., 2033 Santa Fe Ave., Los Angeles 21, Calif.*

(For Convenience Circle Index Code 0714)

(Continued on next page)

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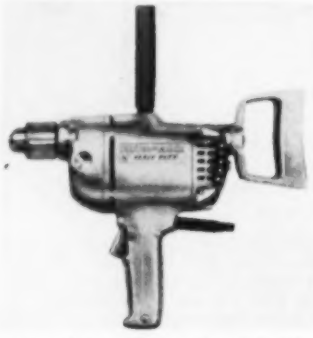
SHOP EQUIPMENT NEWS

(Continued from previous page)

NEW ½-IN. DRILL

A new heavy-duty ½-in. electric drill with a powerful 6-ampere motor that develops great chuck twist power, has just been produced by the Porter-Cable Machine Company.

The drill, Model 516, is surprisingly compact and light for its heavy power. It weighs only 10 lb., and measures 14¼ in. long, 3½ in. wide, and 9⅞ in. high. The rear spade-type handle is adjustable for vertical or horizontal position, or may be removed entirely in cramped quarters.



New ½-in. Heavy Duty Drill

An extra handle permits the operator to apply more pressure and maintain accuracy. A trigger switch provides finger-tip control, with a push button lock for one-hand operation. The drill has a ½-in. gear type chuck for positive slip-proof grip on bits. Bit capacity is rated at ½ in. for steel and 1⅜ in. in wood.

A special vertical drill stand, model 5012, has also been designed by Porter-Cable to convert the ½-in. drill into a drill press.

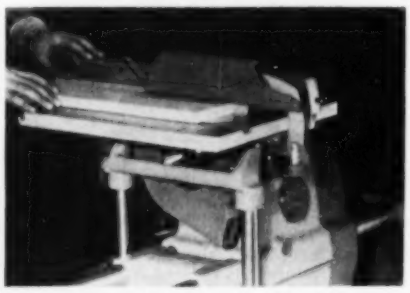
For complete details, write *Porter-Cable Machine Co., 46 Exchange St., Syracuse 8, N. Y.*

(For Convenience Circle Index Code 0715)

SUPER SAFE SAWING

Shopsmith Mark 5's exclusive new saw guard covers the blade above and below the table, yet does not interfere with the work.

(Continued on page 44A)



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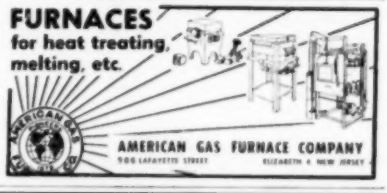

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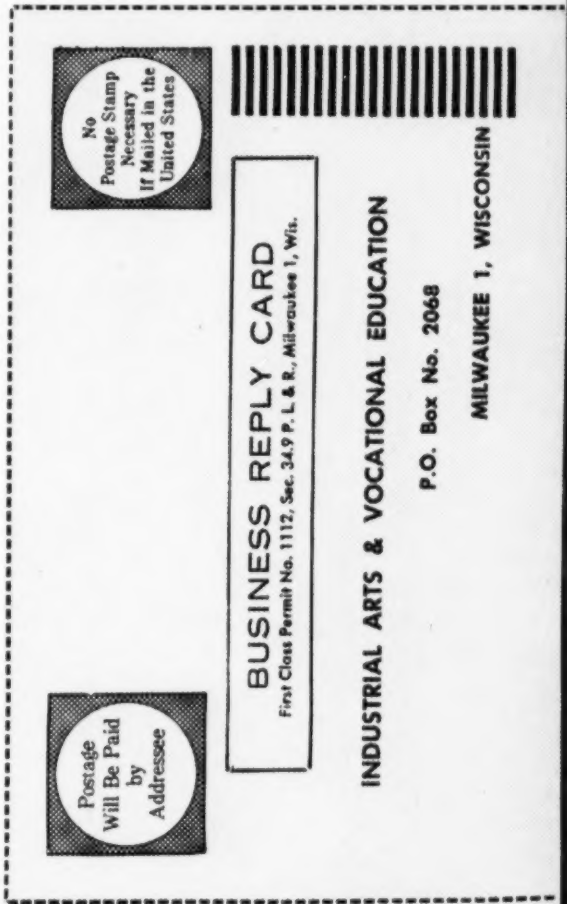
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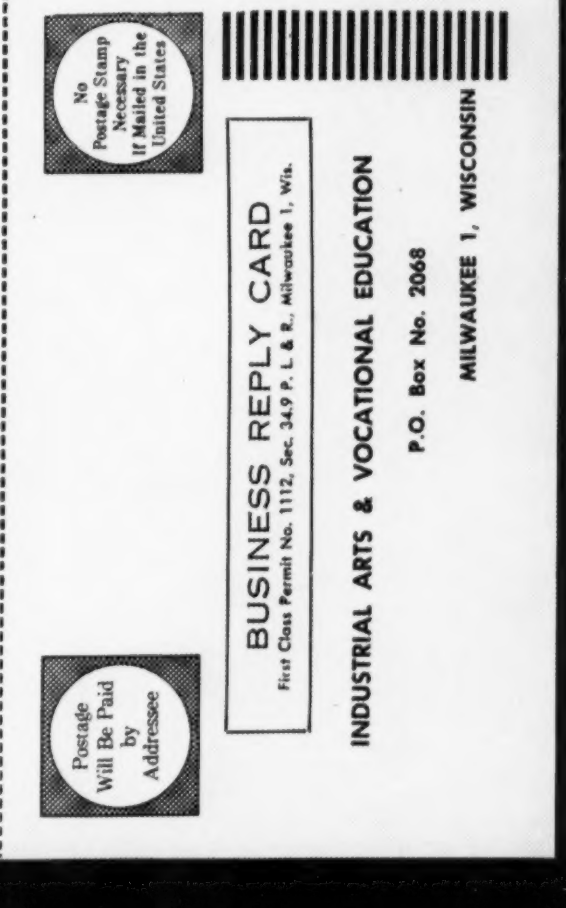
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